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ABSTRACT

This teacher's guide contains activity modules designed to help explain present energy use patterns and basic concepts in energy use. Also covered in the manual are suggestions for energy-related field trips and strategies for successfully conducting such trips. The activities are presented according to grade level, including primary, intermediate, junior high, and high school levels. An energy information resource list is also provided. (Author/RE)

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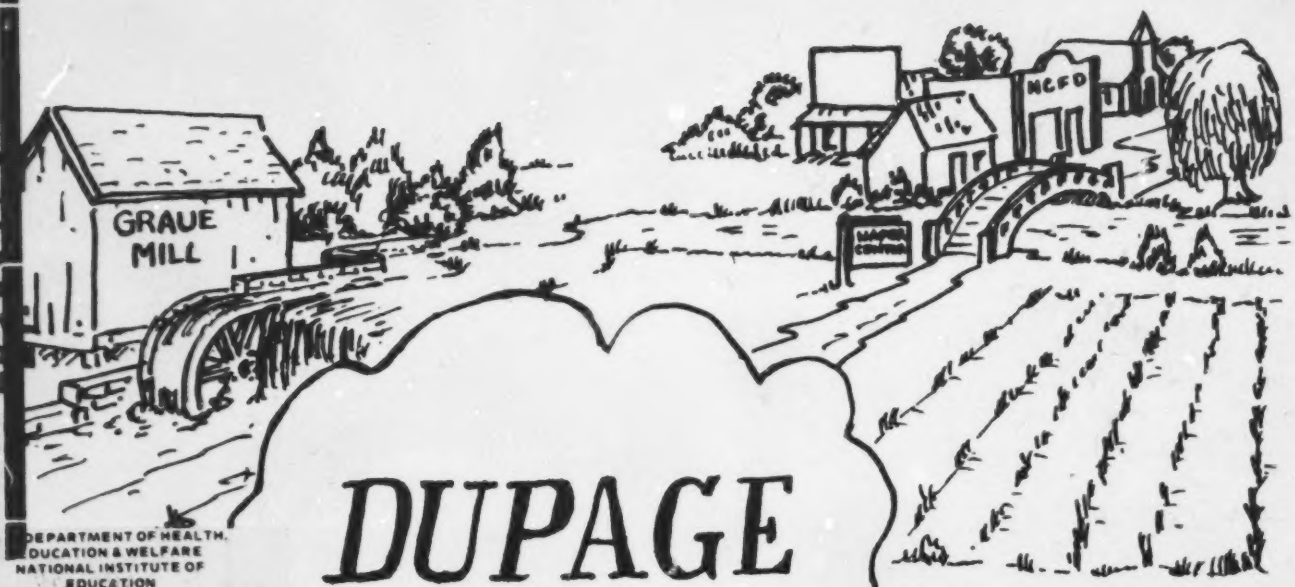

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MAYORS AND MANAGERS ENERGY EDUCATION PROJECT

SE 031 429

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Illinois Energy Conservation Program

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The Country is in an energy crisis. It is obvious that energy interrelated with the environment and with the economy will be perhaps the most influential shaper of our future. It is vital that all of our citizens, especially those citizens of school age are aware of energy issues and their impacts.

The DuPage Mayors and Managers Conference was formed for the purpose of fostering intergovernmental cooperation amongst its members, and to seek to improve the services local governments provide. A major activity of the Conference has been to increase the energy efficiency of municipal operations and to make the citizens of DuPage County more aware of energy efficient practices. As part of this effort, the DuPage Mayors and Managers Conference is providing materials developed under the Community Energy Conservation Grant Program funded by the Illinois Institute of Natural Resources. The program titled "Proposition Providence" attempts to look toward and prepare for the future as it relates to energy consumption. The following materials are being provided to the school systems in DuPage County to assist the County's youngest citizens in developing an energy awareness. It is one of seven elements of "Proposition Providence".

The DuPage Mayors and Managers Energy Education Project was developed by Energy Education Programs and Messrs. Dennis R. Gaul and Michael C. Kynell of Woodstock, Illinois. The workbook has been divided into Primary, Intermediate, Junior High, and High School grade levels and includes a variety of energy conservation classroom activities and field trip experiences which interface the operations of individuals, schools, and municipal services with energy conservation. The materials are interdisciplinary in format and are to be used as supplemental materials to existing curricula. The materials are localized to DuPage County to provide familiar and easily accessible sites for learning. Teachers are encouraged to call on their local governments as a source of information, as a field trip site, and as a model from which to study.

The workbook has been compiled in a tearout format to allow the individual pages to be easily removed and copied for distribution to instructors and students of various age levels.

Carol Wirkus, Project Coordinator
Steven E. Aavang, Executive Director

Introduction

The DuPage County Energy Education Project is an effort to help teachers at all grade levels throughout the county realize that there are many things that they can do to highlight our current energy needs and uses as well as possible future sources of energy. It is hoped that all teachers will become involved in considering their role in our energy-go-round, first as consumers and secondly as teachers of tomorrow's voters.

One of the goals of this project is to put in the hands of teachers a manual which will help them directly in the classroom. A series of activity modules have been prepared which will help explain our present energy use patterns as well as basic concepts in "energy use".

Another major goal of this project is to put into the hands of teachers a manual dealing with energy related field trips and strategies for successfully conducting such trips as an adjunct to classroom activities. A series of sample activities to be carried out on such trips will also be included.

It is hoped that as a result of reviewing and using these materials, teachers and students will gain significant insights into our energy situation and thereby make better decisions in the areas of energy use and energy politics.

It is further hoped that students and teachers will develop a clearer picture of their role as citizens in our interdependent society.

Once an understanding of the need for community support facilities such as fire departments, sewage treatment plants, police protection units, and street departments is gained, the attention of the student can be directed to the associated energy costs of these services. Hopefully the students will learn to be responsible citizens who will consider their demands for increased services in ways that lead to more efficient uses of energy.

This project is being sponsored by the DuPage Mayors and Managers Conference in cooperation with the DuPage County Educational Service Region. The funds for this project were awarded to The Mayors and Managers Conference by the Illinois Institute of Natural Resources and the United States Department of Energy.

What is Energy Education?

Energy Education is a confrontation between the concept of our present life style and the concept of what it costs to produce and maintain that life style.

Energy education is reality education--reality being defined as that which truly exists here and now.

Energy education is a study of futuristics. The future that all of us must be willing to live in and accept is the one that we are continuing to create right now by the decisions that we are making as citizens in an energy intensive society.

Energy education is the challenge of today and tomorrow. Can you as an educator help our society make some very difficult choices for the future? Can you explain how we as a country became ensnared in the energy merry-go-round? Can you explain to your

classes where energy comes from, what the basic sources of energy are today, how energy is converted from one form to another, or which forms of energy are the most used in our society?

If energy education sounds to you like it is a job for more than one person, you are right. You need help. You have to go out in your own district and recruit help. You have to convince others that tomorrow may hold some unpleasant surprises for us all unless we all work together to find meaningful and workable solutions to our problems.

Your First Job!

The first obstacle you have to deal with is yourself. You know that it is a lot easier as a teacher not to deal with anything controversial in the classroom. By talking about the energy situation you are going to get involved in the problems that confront us all on a world wide basis. You will have to fight to get curricula rewritten so there is time allotted for the subject of energy. You will have to convince teachers other than those involved in environmental education or science that they must become involved in dealing with the topic of energy in their classroom. Most important of all, you must get everyone involved in, or concerned with, education to begin examining their own personal attitudes and life styles as they relate to energy if you are going to succeed in providing a program that has the necessary impact. This includes the board of education, administrators, teachers, coaches, transportation people, custodians, cooks, students, parents, business and industry people, governmental people, and every citizen in general. You may ask yourself, "Why should I get involved?", or "Where am I going to find all the information that I need?".

Why Me?

In answer to the first question, you should get involved because you are in a position to affect great changes in the next few years. You hold in your hand the key to a future which we can all accept if we begin immediately to examine the way we live, why we live that way, and how we can do things differently. As a professional educator you can be one of the most important people in this country, if you choose to be.

Where Do I Start?

In answer to the second question, the information that you need to do an effective job in the classroom is available from hundreds of sources at anywhere from no cost to high cost. If you want complete surveys of total energy consumption patterns you will have to pay for them. If you want materials that deal with specific energy problems to hand out to your students they generally are available from either the federal government or private utilities at no cost. You will find that some of the things you receive are totally worthless while others are priceless. You are the best judge of what materials are of value to your program. Invariably, you will find that some information is not usable and will be disposed of ultimately. By the way, don't expect

any of the information you receive to fit exactly into the program that you are going to develop. You will have to razor, rip apart, reorganize and reproduce the materials you want your students to use.

Can I Get Help?

Let's assume that you undertake the teaching of energy in your classroom and you touch on the topic "The Quality of Life", but don't feel very qualified to deal with that subject. Why not make your classroom an open forum to members of your local and regional community. Ask people from local industries to talk to your students about life styles. Ask religious leaders to talk about moral values and consumption habits. Ask government leaders to talk about regulations concerning personal liberties and personal choices. Ask representatives from the environmental movement to explain ecosystems and socio-economic symbiotic relationships as they affect life styles. You might find members of your own staff who have special areas of strength and would be willing to become involved in your program.

Should I Be Controversial?

Don't be afraid to introduce controversy into your classroom. Don't be afraid to play the role of devil's advocate to provoke arguments concerning critical points in the area of energy. Don't assume that you are the ultimate source of all pertinent information. Be willing to allow students to challenge your information base and authority. If you have been the type of teacher who has not practiced these techniques on a regular basis you may find yourself struggling to allow your classroom to become a forum of discussion and debate. Once you have overcome the initial shock that you might not know everything you will find yourself becoming excited because you are getting involved with your students.

Introduce All Viewpoints!

In teaching energy, you cannot restrict yourself to only one point of view such as environmental issues, conservation, or the production of energy because each is intricately interwoven with the others. Any energy curriculum or course should include as a minimum, resources, utilization, production, distribution, conservation, and environmental concerns. To this could be added numerous other topics such as government regulations, socio-economic factors, and national and international politics. When you begin to develop resources to deal with the five areas, you will have to work at overcoming your own prejudices. Don't exclude any of the viable, workable forms of energy from discussion because of your own biases. Be willing to deal with those topics you already have strong opinions on with an air of objectivity and true inquiry. Students will detect biases without you beating them over the head with your own judgements thereby stifling any desire to be innovative or creative.

No one can question the need for energy education. The fact that you are reading this is an indication that you are concerned and either are involved or will be involved in the near future. Your biggest asset in working with students or other teachers will be your imagination and enthusiasm in developing the most dynamic program possible.

PRIMARY

Teacher Background

At the primary level (K-3) the student lives in the somewhat limited world of the home, the school, and the path in between. If awareness of the interrelationships of energy use, conservation, and life styles are to be achieved then the child must develop an appreciation of what has gone before. Basically, what is needed are answers to questions like, "Where did I come from?" or "How did I happen to live where I do?" or "How did my town begin?" As these students travel into their limited world they need to understand that what is here today has not always been, but that generation upon generation have come and gone, buildings have been built and torn down and little rural, farming villages have grown into sprawling shopping centers, dominating housing developments, and endless freeways and feeder highways that have been spurred on by the use and misuse of the private automobile.

The concept that is being stressed at this level is that of change; change from the early subsistence farming that characterized this area at the turn of the century, change from the horse drawn carriage, change from the time when epidemics wiped out whole communities, change from the time when school was held in one room, poorly heated buildings with all ages competing with each other.

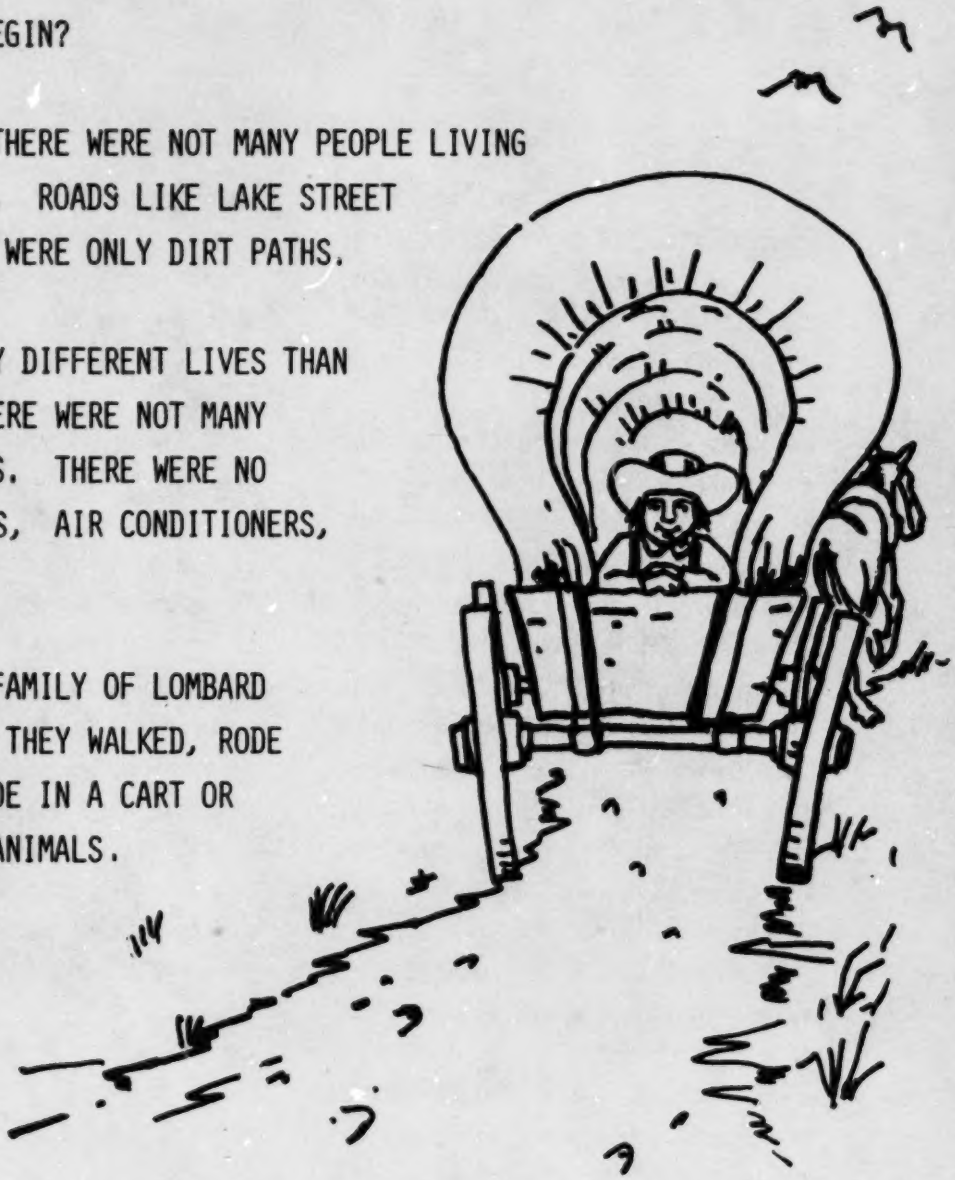
The underlying concepts being presented are the effect of technology on our way of life and the harnessing of energy to make the desired changes. As needs were identified, intellectual creativity rose to fill those needs and the energy to get the job done was developed. As one solution led to other solutions and our technology grew and developed our world changed. Essentially, we learned how to use machines and energy to do more and more of the jobs we used to have to do ourselves.

HOW DID IT ALL BEGIN?

A LONG TIME AGO THERE WERE NOT MANY PEOPLE LIVING IN DUPAGE COUNTY. ROADS LIKE LAKE STREET AND OGDEN AVENUE WERE ONLY DIRT PATHS.

PEOPLE LIVED VERY DIFFERENT LIVES THAN WE DO TODAY. THERE WERE NOT MANY STORES OR SCHOOLS. THERE WERE NO TELEVISIONS, RADIOS, AIR CONDITIONERS, OR CARS.

WHEN THE MORTON FAMILY OF LOMBARD WANTED TO TRAVEL THEY WALKED, RODE ON HORSES, OR RODE IN A CART OR WAGON PULLED BY ANIMALS.



PEOPLE HAD TO DEPEND ON THEMSELVES FOR MOST OF THE THINGS WE BUY IN STORES.

FIND OUT WHEN YOUR FAMILY MOVED TO DUPAGE COUNTY.

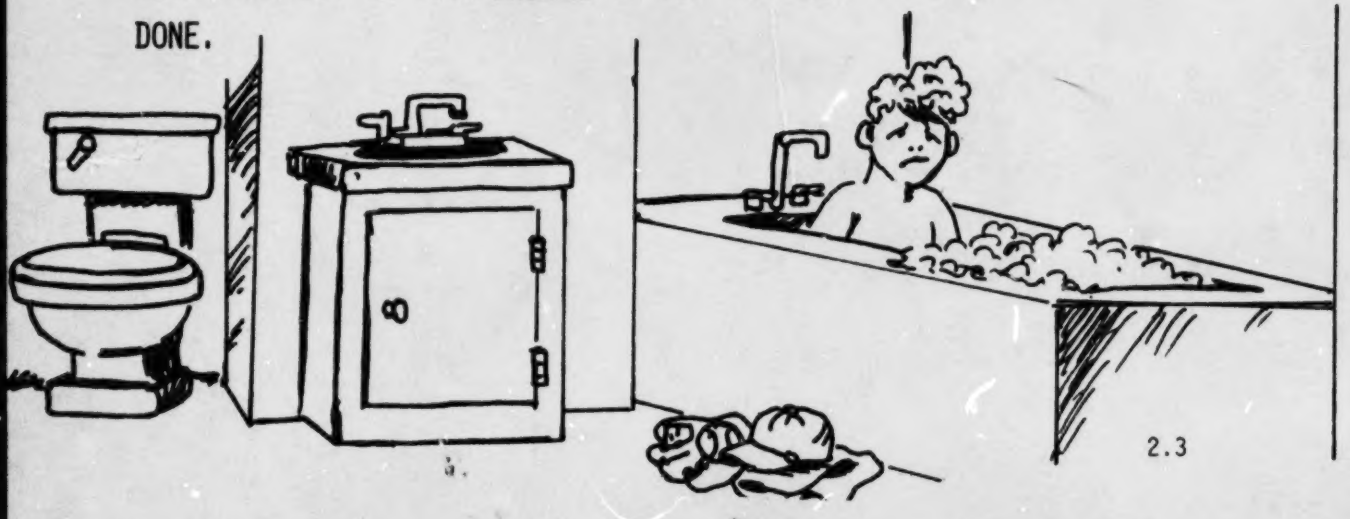
FIND OUT WHEN THE FIRST PEOPLE MOVED TO YOUR CITY.

WHAT HAPPENED TO CHANGE THE WAY WE USED TO LIVE?

SOMETHING AS SIMPLE AS WASHING YOUR HANDS USED TO BE QUITE A JOB. FIRST A WELL HAD TO BE DUG DEEP INTO THE GROUND. TO GET THE WATER OUT OF THE WELL TOOK WORK. THEN THE WATER HAD TO BE CARRIED BACK TO THE HOUSE.

SOMEBODY GOT THE IDEA THAT THE WIND COULD BE USED TO DO SOME OF THE WORK OF GETTING WATER. THE WINDMILL WOULD PUMP THE WATER INTO BIG TANKS SO THERE WOULD ALWAYS BE PLENTY. BUT WE STILL HAD TO GO OUTSIDE TO GET THE WATER.

THEN SOMEBODY TRIED BRINGING WATER THROUGH PIPES RIGHT INSIDE THE HOUSE. IT WAS A LOT LESS WORK BUT IT TOOK <u>ENERGY</u> TO GET THE JOB DONE.

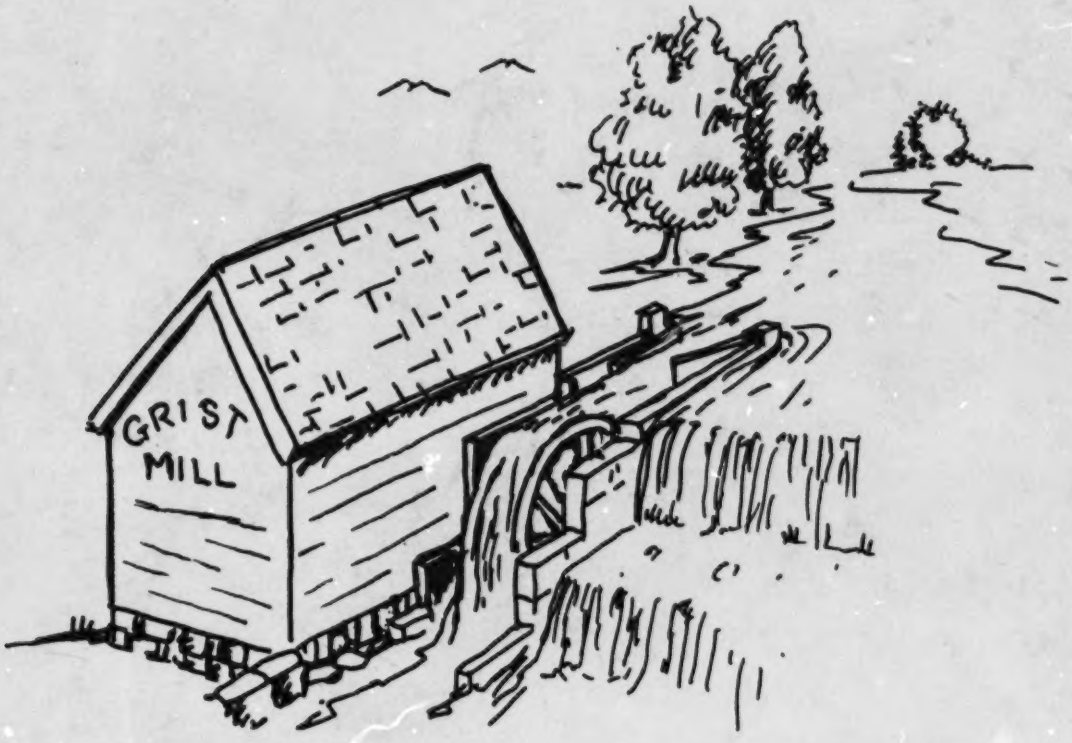


2.3

WE INVENTED ALL TYPES OF THINGS TO MAKE OUR WORK EASIER.

PEOPLE CAME TO DUPAGE COUNTY BECAUSE THEY WANTED TO MAKE NEW HOMES FOR THEIR FAMILIES. MOST FAMILIES LIVED ON FARMS AND PRODUCED ALMOST EVERYTHING THEY NEEDED. ONE JOB THAT WAS HARD FOR THEM WAS GRINDING THE GRAIN THEY NEEDED TO MAKE BREAD.

HOW COULD THEY USE ENERGY TO MAKE GRINDING CORN OR WHEAT AN EASY JOB?

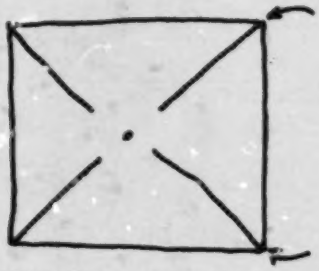


SOME VERY SMART PERSON BUILT A WATER WHEEL.

FIND OUT HOW A WATER WHEEL WORKS.

LET'S MAKE ENERGY WORK FOR US.

MAKE A PINWHEEL FROM A SQUARE PIECE OF PAPER.



CUT AND FOLD OVER EACH CORNER TO THE MIDDLE AND PIN TO A STRAW.

DOES A WINDMILL WORK ALL THE TIME?

WHAT HAPPENS WHEN THE WIND DOES NOT BLOW?

COULD A WINDMILL PUSH A CAR DOWN THE ROAD?

WHAT KIND OF JOBS COULD THE WIND DO FOR US TODAY?

TO WATCH A WATER WHEEL WORK YOU CAN VISIT THE GRAUE MILL IN HINSDALE. THE MOVING WATER OF THE SALT CREEK MAKES THE BIG WATER WHEEL TURN. THE WATER WHEEL TURNS THE GRINDING STONES THAT ARE IN THE MILL.

DO YOU THINK IT WAS A GOOD IDEA TO MAKE THE WATER WHEEL WORK FOR US?

WOULD THE WATER WHEEL WORK ALL THE TIME?

EVEN IN THE WINTER?

THINGS SURE HAVE CHANGED A LOT!

MOST OF THE DIRT ROADS IN DUPAGE COUNTY ARE GONE. THERE ARE ALMOST NO WINDMILLS OR WATER WHEELS ANYMORE. THE INVENTION OF MACHINES TO DO WORK HAS CHANGED THE WAY WE LIVE.

WHEN IT IS DARK OUTSIDE WE CAN TURN ON THE LIGHTS.

WHEN IT IS VERY COLD OUTSIDE WE CAN TURN UP THE HEAT.

WHEN WE HURT OURSELVES AND NEED HELP WE CAN USE THE TELEPHONE TO CALL FOR HELP.

WHEN WE ARE SICK WE CAN GO TO SEE A DOCTOR AT A HOSPITAL.

WHEN WE ARE HUNGRY WE CAN GET SOMETHING TO EAT FROM THE REFRIGERATOR OR AT THE GROCERY STORE.

WHEN WE WANT TO GO SOMEWHERE WE CAN RIDE IN A BUS, A TRAIN, A PLANE, OR A CAR.

BUT DO YOU KNOW THAT TO DO ALL THESE THINGS WE NEED ENERGY? LOTS OF ENERGY!

WHERE DOES OUR ENERGY COME FROM?

HERE IN DUPAGE COUNTY WE DON'T PRODUCE MUCH ENERGY. BUT WE SURE USE A LOT TO MAKE ALL OUR CARS RUN AND TO HEAT ALL OUR HOMES AND SCHOOLS. WHERE DO WE GET OUR ENERGY? ALMOST ALL THE ENERGY WE USE IS PRODUCED SOMEWHERE ELSE AND COMES TO US IN DIFFERENT WAYS.

OIL IS PUMPED OUT OF DEEP WELLS AND CARRIED BY PIPELINES OR TANK TRUCKS. HALF OF ALL THE OIL AND GASOLINE WE USE COMES FROM FAR AWAY COUNTRIES. IT MUST BE CARRIED ON GIANT SHIPS CALLED TANKERS. AS THE OIL AND GASOLINE WE USE BECOMES HARDER TO FIND THE COST GOES HIGHER AND HIGHER.

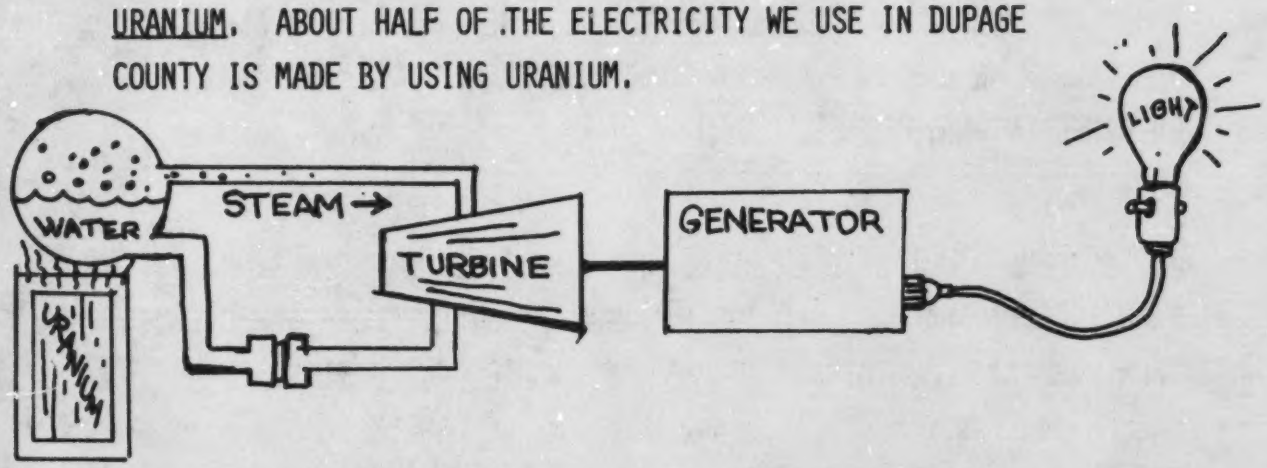
NATURAL GAS IS ALSO PUMPED OUT OF DEEP WELLS. IT GIVES US THE ENERGY TO HEAT OUR HOMES, SCHOOLS, AND FACTORIES. NATURAL GAS IS CARRIED IN PIPES THAT RUN UNDER THE GROUND. THE COST OF NATURAL GAS IS GOING HIGHER BECAUSE IT IS ALSO HARDER TO FIND.

ANOTHER BIG SOURCE OF ENERGY IN OUR COUNTRY IS COAL. COAL IS DUG OUT OF THE GROUND AND COMES TO US ON LONG TRAINS. COAL IS USED IN FACTORIES OR IN BIG POWER PLANTS THAT MAKE ELECTRICITY.

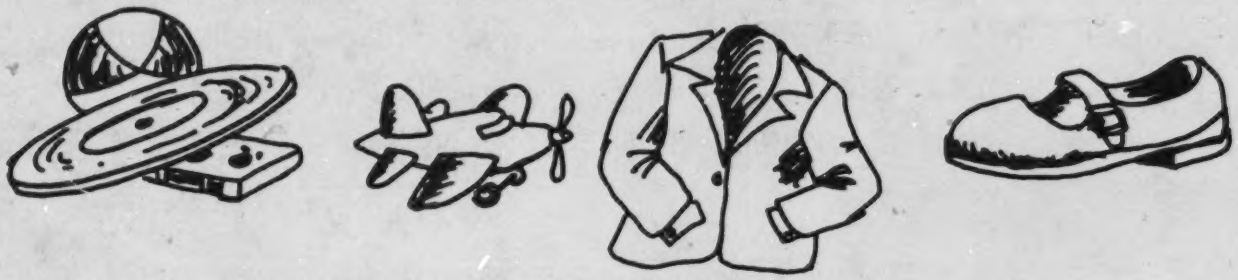
ALL OF THE ENERGY SOURCES ON THIS PAGE ARE CALLED FOSSIL FUELS. THEY ARE MADE FROM THE FOSSILS OR REMAINS OF PLANTS AND ANIMALS THAT LIVED AND DIED A LONG TIME AGO.

WHAT OTHER KINDS OF ENERGY DO WE USE?

BESIDES THE FOSSIL FUELS WE HAVE A SPECIAL ENERGY SOURCE CALLED NUCLEAR ENERGY. NUCLEAR ENERGY USES A FUEL CALLED URANIUM. ABOUT HALF OF THE ELECTRICITY WE USE IN DUPAGE COUNTY IS MADE BY USING URANIUM.



WE CAN USE ANY OF THE FOSSIL FUELS TO MAKE ELECTRICITY. THE ONLY THING WE CAN MAKE FROM URANIUM IS ELECTRICITY. WE CAN MAKE LOTS OF OTHER THINGS FROM THE FOSSIL FUELS.



ELECTRICITY IS ONE OF THE MOST COMMON WAYS WE USE (OR CONSUME) ENERGY. WE CAN USE ELECTRICITY TO DO ALL KINDS OF THINGS FOR US. IT CAN HEAT OUR HOMES, RUN MOTORS, KEEP US COOL, AND MAKE OUR LIGHTS WORK.
CAN YOU THINK OF WAYS WE USE ELECTRICITY?

1. _____ 2. _____

3. _____ 4. _____

WILL THERE BE ENOUGH ENERGY FOR TOMORROW?

HERE IN DUPAGE COUNTY WE ARE WORKING VERY HARD TO DEVELOP NEW ENERGY SOURCES FOR THE FUTURE. AT ARGONNE LABORATORY SCIENTISTS ARE TRYING ALL KINDS OF NEW IDEAS. THEY ARE WORKING SO THAT SOME DAY WE CAN USE THE GREAT ENERGY OF THE SUN. AT THE FERMI LABORATORY OTHER SCIENTISTS ARE STUDYING SO THAT WE CAN UNDERSTAND ENERGY BETTER. SOMEDAY, MAYBE YOU COULD VISIT BOTH OF THESE PLACES WITH YOUR PARENTS.

RIGHT NOW YOU CAN HELP SAVE SOME OF OUR ENERGY SO WE HAVE SOME LEFT FOR TOMORROW. TRY AND DO ALL OF THESE THINGS.

1. DO NOT PUT MORE WATER INTO THE BATHTUB THAN YOU REALLY NEED.
2. DO NOT JUST STAND IN THE SHOWER BECAUSE IT FEELS GOOD.
3. MAKE SURE YOUR CLOTHES ARE DIRTY BEFORE YOU PUT THEM IN THE LAUNDRY.
4. TURN THE LIGHTS OFF WHEN YOU ARE NOT IN A ROOM.
5. WHEN YOU WASH YOUR HANDS, PUT SOME WATER IN THE SINK; DO NOT JUST LET IT RUN.
6. WHEN YOU BRUSH YOUR TEETH, TURN THE WATER OFF WHILE YOU ARE BRUSHING.
7. TURN THE T.V. OFF WHEN YOU ARE DONE WATCHING IT.

Teacher Background

At the primary level change was the emphasized concept. Building on an enhanced appreciation of what has happened, it is important for the intermediate grade student to begin to understand further the interrelatedness of the society we share.

The student should be able to grasp the idea that as individuals we produce almost none of the products or services we use. The student should also be capable of understanding that we have come more and more to depend on fossil fuel energy to do much of our work for us.

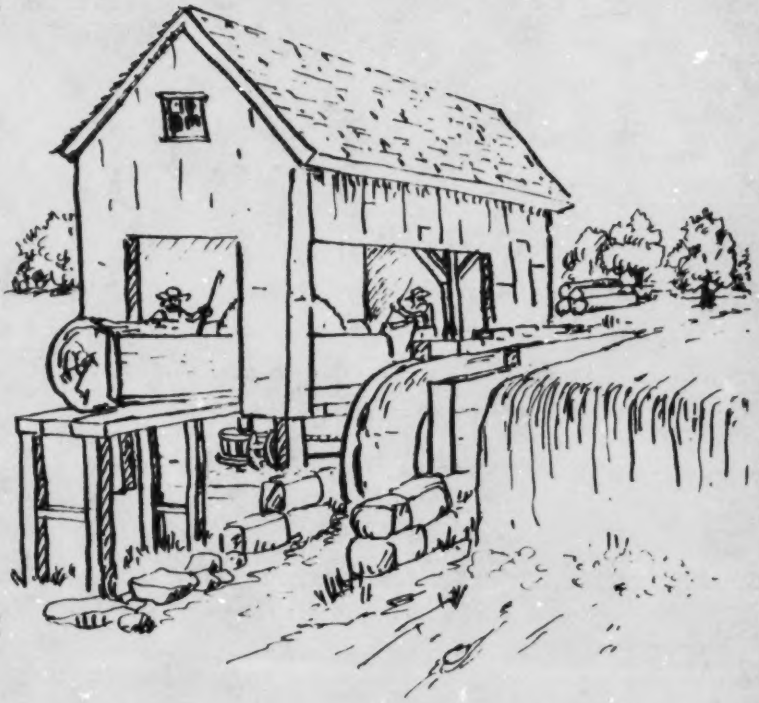
Futhermore, the student should begin to realize that as a basically urban society we depend heavily on local and state government to help manage some of the more complex activities necessary to a high standard of living such as fire and police protection, maintenance of streets and sanitation systems, and social services for young and old.

It is very important at this grade level that the student begins to realize that our world is very energy intensive. However, it is equally important for them to understand that changes in energy use can be made without drastically altering the way we live. Conservation does not mean doing without, it means doing the best with what is available. Finally, the student should be helped to understand that every person can have an impact on energy consumption.

Vocabulary List

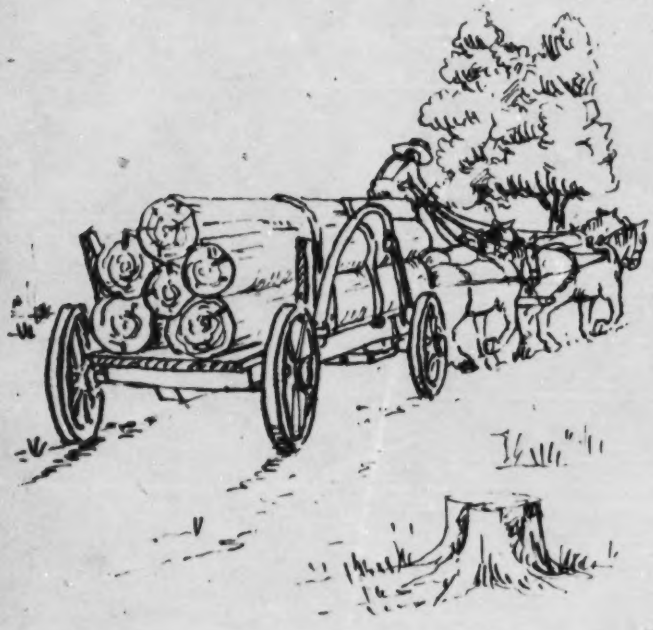
1. fossil fuel
2. synthetic fuel
3. best use
4. factory
5. uranium
6. city council
7. scientist
8. transportation
9. urban
10. alternative energy

WHAT KIND OF ENERGY CONSUMERS WERE WE?



BACK IN 1831 WHEN BAILEY HOBSON BUILT DUPAGE COUNTY'S FIRST SAW-MILL PEOPLE DID NOT CONSUME VERY MUCH ENERGY. THE TYPES OF ENERGY PEOPLE DID MAKE USE OF WAS VERY DIFFERENT THAN THE TYPES WE USE TODAY. HOBSON'S SAWMILL USED THE ENERGY OF THE MOVING WATER IN THE DUPAGE RIVER TO CUT TIMBER INTO WOOD PLANKS SO SETTLERS COULD MORE EASILY BUILD CABINS AND HOMES.

WHEN BAILEY WANTED TO MOVE THE CUT WOOD TO A CUSTOMER'S NEW HOME SITE HE DIDN'T LOAD THE WOOD ONTO A BIG, POWERFUL SEMI-TRAILER. INSTEAD, HE USED A WOODEN WAGON HITCHED TO A TEAM OF TWO OR MAYBE FOUR HORSES. RATHER THAN BEING ABLE TO DELIVER THE READY WOOD IN AN HOUR, THE DELIVERY MIGHT TAKE SEVERAL DAYS, MAYBE EVEN A COUPLE OF WEEKS.



THE ROADS THAT HAD BEEN CUT OUT OF THE WOODS WERE NOTHING MORE THAN DIRT PATHS. LAKE STREET (ROUTE 20) WAS A SERIES OF MUD HOLES, BROKEN WHEELS, AND WAGON WHEEL RUTS FROM ONE END OF DUPAGE COUNTY TO THE OTHER.

TRANSPORTATION WAS REALLY A PROBLEM!

WE THINK THAT OUR MODERN TIMES ARE THE ONLY TIMES THAT HAVE HAD PROBLEMS WITH MOVING PRODUCTS AND PEOPLE FROM ONE PLACE TO ANOTHER. ONCE THE ILLINOIS AND MICHIGAN CANAL OPENED IN 1848 TRAFFIC MOVING ALONG THE RUT FILLED ROADS OF DUPAGE COUNTY BECAME SO CONGESTED THAT CHILDREN WERE WARNED NOT TO "CROSS THE ROAD" FOR FEAR OF BEING STRUCK BY A WAGON!

AS MANY SETTLERS AS POSSIBLE USED BARGES ON OPEN RIVERS OR THE CANAL TO TRANSPORT THEIR PRODUCTS TO MARKET FOR TWO VERY IMPORTANT REASONS:

1. IT WAS CHEAPER THAN USING HORSES AND
2. THE RIVER WENT THE RIGHT DIRECTION SO THERE WAS A CHANCE TO AVOID THE TRAFFIC ON THE ROADS (SOUND FAMILIAR?).

IN THE EARLY DAYS OF DUPAGE COUNTY PEOPLE RELIED ON THEMSELVES AS MUCH AS THEY COULD FOR THE THINGS THAT THEY NEEDED. THEY GREW THEIR OWN FOOD (NOT FAST FROZEN), MADE THEIR OWN CLOTHES (NO SEARS, YET), BUILT THEIR OWN SHELTER (HOMES, THAT IS), AND PROVIDED THEIR OWN TRANSPORTATION (FEET).

3.3

HERE COMES THE RAILROAD!

WITH THE GROWTH OF TOWNS AND VILLAGES ALONG BARGE CANALS AND RIVER ROUTES AS WELL AS ON THE MORE TRAVELLED ROADS (LAKE STREET, ARMY TRAIL ROAD, BUTTERFIELD ROAD AND ROOSEVELT ROAD) IT WASN'T LONG BEFORE THE RAILROADS MADE THEIR APPEARANCE. RUNNING ON A REGULAR SCHEDULE, REGARDLESS OF THE WEATHER, RAILROADS OFFERED RELIABLE AND CHEAP TRANSPORTATION FOR ALMOST EVERYONE. THE FARMER COULD MOVE HIS PRODUCTS TO MARKET EASIER. NEWCOMERS COULD MOVE INLAND FROM THE LAKE AND BARGE ROUTES WITHOUT BUYING A HORSE AND WAGON FIRST. NEW FANGLED GADGETS LIKE THE CLOTHES WASHER COULD BE SHIPPED OUT TO THE FARM TOWNS EASIER, FASTER, AND CHEAPER THAN EVER BEFORE. PEOPLE EVERYWHERE HAILED THE RAILROAD AS THE BEGINNING OF A NEW LIFE. CITY COUNCILS WOULD FIGHT WITH NEIGHBORING COUNCILS TO SEE WHO WOULD "GET THE RAILROAD" INTO THEIR TOWN.

THE RAILROAD BROUGHT OTHER CHANGES. WE BEGAN TO USE A LOT MORE ENERGY.

WHAT KIND OF ENERGY WAS NEEDED TO MAKE STEEL TRACKS? _____

_____

WHAT KIND OF ENERGY WAS NEEDED TO MAKE THE TRAINS OPERATE? __

_____

DID USING THIS MUCH ENERGY CAUSE ANY PROBLEMS? _____

_____

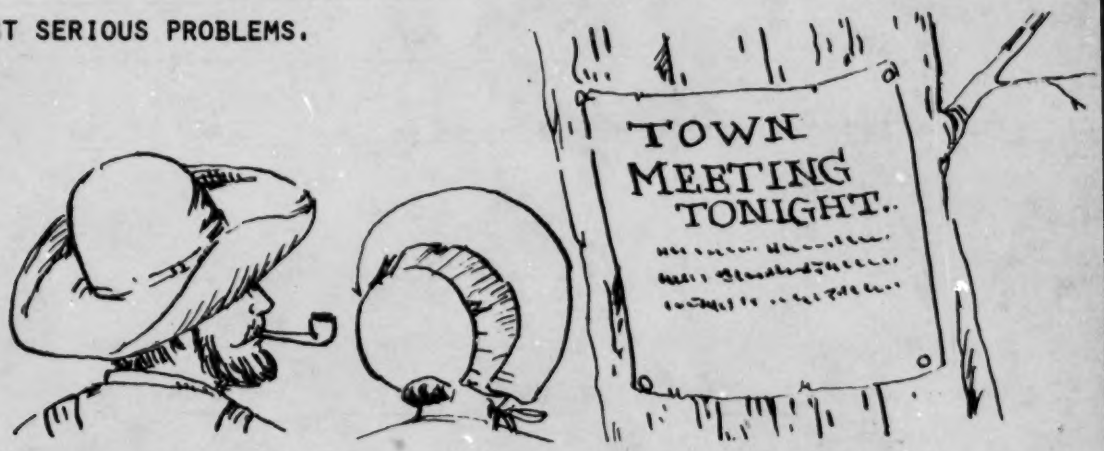
WAS LIFE BETTER BECAUSE MORE ENERGY WAS BEING USED? _____

_____

SOMETHING HAD TO BE DONE!

AS MORE AND MORE PEOPLE MOVED INTO NAPER'S CENTER, LOMBARD (ORIGINALLY BABCOCK'S GROVE), WHEATON, DOWNERS GROVE AND OTHER GROWING COMMUNITIES IT BECAME CLEAR THAT CHANGES WERE GOING TO HAVE TO BE MADE.

TOWNS AND VILLAGES BECAME ORGANIZED, ELECTED CITY COUNCILS AND MAYORS, AND SET ABOUT THE TASK OF STRAIGHTENING OUT SOME OF THE MOST SERIOUS PROBLEMS.



THE MOST IMPORTANT ITEMS ON THE AGENDA OF ANY TOWN MEETING USUALLY CENTERED ON TRANSPORTATION AND BELIEVE IT OR NOT, FIRE FIGHTING! COMMITTEES WERE ESTABLISHED TO TAKE CARE OF FILLING IN POTHOLES AND DIGGING DITCHES TO DRAIN AWAY RAIN WATER. OTHER COMMITTEES WERE FORMED TO ESTABLISH BUCKET BRIGADES WHEN FIRES BROKE OUT. VOLUNTEER FIRE FIGHTING COMPANIES WERE STARTED, THEIR JOB WAS TO PROTECT LIFE AND PROPERTY.

ARE THE PROBLEMS WE FACE TODAY DIFFERENT?

HOW MANY OF THE PROBLEMS OUR CITIES FACE TODAY ARE RELATED TO ENERGY?

WHAT KIND OF LEADERS DO WE NEED IN OUR CITY COUNCILS TODAY?

LIFE SURE CHANGED!

AS DUPAGE COUNTY BECAME MORE AND MORE AN URBAN AREA, WE HAD TO DEPEND ON OTHERS FOR WHAT WE USED TO DO OURSELVES. WE ALSO USED LARGE AMOUNTS OF FOSSIL FUELS TO GIVE US THE ENERGY WE CONSUMED.

WHAT ARE THE FOSSIL FUELS?

1. _____ 2. _____ 3. _____

CAN YOU THINK OF SOME THINGS WE DO WITH EACH OF THE FOSSIL FUELS?

1. _____ 2. _____ 3. _____

_____ _____ _____

_____ _____ _____

WHICH OF THE FOSSIL FUELS DO YOU THINK WE USE THE MOST?

_____

DO YOU THINK THERE IS ANYTHING YOU CAN DO TO HELP SAVE SOME OF OUR FOSSIL FUELS? WHAT? _____

_____

BECAUSE WE USE SO MUCH ENERGY THERE ARE MANY SCIENTISTS WORKING ON NEW WAYS TO GET ENERGY. THEY ARE STUDYING THE SUN, PLANTS THAT GROW IN THE OCEANS, THE WIND, URANIUM, SYNTHETIC FUELS, AND MANY OTHER ALTERNATIVE SOURCES TO MEET OUR ENERGY DEMANDS.

WE NEED EACH OTHER.

IN OUR URBAN SOCIETY WE HAVE COME TO DEPEND ON EACH OTHER MORE AND MORE. VERY FEW OF US PRODUCE ANY OF THE PRODUCTS OR SERVICES WE USE AND TAKE FOR GRANTED EVERYDAY OF OUR LIVES. WE DEPEND ON FACTORIES OF ALL KINDS TO MAKE THE PRODUCTS WE USE LIKE SHOES, COATS, BICYCLES, SKATEBOARDS, TELEVISIONS, FURNITURE AND SO ON. EACH OF THOSE FACTORIES HIRE LOTS OF PEOPLE TO DO ALL THE DIFFERENT JOBS. IN EACH FACTORY THERE ARE ALL KINDS OF MACHINES TO MAKE THE JOBS EASIER AND SAFER. EACH FACTORY USES A LOT OF ENERGY TO RUN THE MACHINES, TO SUPPLY HEAT AND LIGHT, AND ALSO TO SHIP THE FINISHED PRODUCT TO THE STORE NEAR OUR HOME.

BESIDES NEEDING PEOPLE AND ENERGY TO SUPPLY OUR PRODUCTS WE ALSO NEED PEOPLE AND ENERGY TO HELP US. HOSPITALS AND CLINICS HAVE DOCTORS AND NURSES WHO CAN HELP US. BUT HEATING AND LIGHTING AND RUNNING ALL THE EQUIPMENT THE HOSPITALS USE TAKES ENERGY.

IMAGINE THE ENERGY IT TAKES TO RUN ALL THE POLICE CARS AND FIRE TRUCKS WHEN WE NEED HELP IN A HURRY.

WHAT IS HAPPENING TO THE COST OF ALL THAT ENERGY? _____

_____

DO YOU THINK WE CAN GET ALONG WITHOUT THE HELP OF POLICE AND FIRE PROTECTION? _____

IF WE ALL SLOWED DOWN OUT ON THE HIGHWAYS WOULD THAT HELP SAVE ENERGY? _____

WOULD WE NEED POLICE CARS WITH SUCH BIG ENGINES IF EVERYONE DROVE SLOWER? _____

SEE IF YOU CAN FIND OUT HOW MUCH ENERGY IT TAKES TO RUN ALL THE POLICE CARS, FIRE TRUCKS, AND CITY TRUCKS IN YOUR TOWN.

WHERE DOES ALL THE ENERGY GO?

TO HELP YOU UNDERSTAND HOW OUR COUNTRY USES ENERGY TAKE A LOOK AT THE FOLLOWING CHART.

TOTAL ENERGY USE IN UNITED STATES

TRANSPORTATION		56%
FUEL TO RUN VEHICLES	25%	
ENERGY TO BUILD VEHICLES AND MAINTAIN ROADS, AIRPORTS, ETC.	31%	
PRODUCTION FACTORIES		11%
HOME ENERGY USE		19%
SPACE HEATING	10%	
WATER HEATING	3%	
EVERYTHING ELSE	6%	
STORES AND OFFICES		14%
SPACE HEATING	7%	
AIR CONDITIONING	2%	
EVERYTHING ELSE	5%	
		100%

AFTER STUDYING THIS CHART YOU SHOULD BE ABLE TO ANSWER SOME QUESTIONS.

1. WHICH USES THE MOST ENERGY? _____
   TRANSPORTATION, FACTORIES, HOME, STORES & OFFICES
2. WHAT USES THE MOST ENERGY IN OUR HOMES? _____
   SPACE HEATING, WATER HEATING, EVERYTHING ELSE
3. WHICH USES THE MOST ENERGY? _____
   FUEL TO RUN VEHICLES, ENERGY TO BUILD & MAINTAIN
4. WHAT ENERGY USER SHOULD WE REDUCE THE MOST? _____

_____

WHAT CAN I DO ABOUT ENERGY?

ONE OF THE THINGS THAT YOU CAN DO IS TRY TO UNDERSTAND HOW WE USE ENERGY. BY UNDERSTANDING HOW WE USE IT YOU MIGHT COME UP WITH SOME GOOD IDEAS ABOUT HOW WE CAN SAVE ENERGY.

ANOTHER IMPORTANT THING YOU CAN DO IS STUDY ABOUT THE WAYS WE MAKE ENERGY WORK FOR US AND THE KINDS OF ENERGY WE USE. BY DOING THIS YOU MIGHT DISCOVER NEW WAYS WE CAN SUPPLY ENERGY FOR TOMORROW.

THE MOST IMPORTANT THING YOU CAN DO RIGHT NOW IS MAKE THE <u>BEST USE</u> OF ENERGY THAT YOU CAN. WHENEVER POSSIBLE, DON'T WASTE ENERGY. HERE ARE SOME IDEAS TO HELP.

1. WALK OR RIDE YOUR BIKE WHENEVER YOU CAN. DON'T MAKE YOUR PARENTS USE THE CAR.

2. USE COLD WATER TO WASH YOUR HANDS. DON'T LET THE WATER RUN NEEDLESSLY.

3. TURN OFF ALL LIGHTS AND APPLIANCES THAT AREN'T NEEDED.

4. MAKE SURE ALL WINDOWS AND DOORS ARE CLOSED WHEN HEATING OR AIR CONDITIONING.

5. SET THE THERMOSTAT RIGHT - 68° WINTER AND 78° SUMMER

Teacher Background

With the dramatic change between the elementary grades and junior high school a significant shift in the emphasis of an energy program should take place. The greater level of maturity, longer period of attentiveness, ability to develop and understand abstract ideas, and the general shift to departmental programming all point to teaching energy in greatly different ways.

The conceptual building process should continue as much as possible. The concepts introduced at the primary level, and further expanded at the intermediate level should be restated and brought into greater relevance.

All of the basic energy supply systems should be explored and the concepts of cost, benefit, and risk should be considered in each system.

Understanding what systems are currently supplying our energy as well as what each costs (directly and indirectly), the benefits that are provided (economic and social), and the associated risks (real and imagined) will hopefully lead to better decision making.

This age level student should also gain experience in separating fact from opinion and in weighing the "pros" and "cons" of given issues. To aid in achieving these goals this section will include activity modules as well as some pertinent fact sheets.

Vocabulary List

1. environment
2. quadrillion
3. equivalent
4. import
5. finite
6. renewable
7. consumption
8. transportation
9. embargo
10. efficiency

REMEMBER THE GOOD OL' DAYS . . . . .

. . . . . WHEN LIFE WAS SIMPLE AND NEEDS WERE FEW?

It is easy for us in our hustle-bustle world to listen to grandparents as they recall their youth in a bygone era and then to fantasize about the early days of our society when time didn't go so fast. It is rather romantic to think about living "way out yonder" in some wilderness, walking over fields where wild animals live in harmony with their environment.

How many realize that right here, in DuPage County, not too long ago life was like that. The Potawatomie Indians called it "Ausagaunaskee" after the ten foot high prairie grass that covered the open land. Wild game was abundant in the woodlands and settlements were few and far between.

When one first begins to consider the "good ol' days" the thoughts conjured up are truly wonderful. Time was kept by the sun, food was easy to acquire, work was rewarding, and the only concerns worth considering dealt with making better use of nature's bounty. To try to experience these things today all we have to do is visit Churchill Woods Forest Preserve, Naper's Center, or Graue Mill and let our imaginations do the rest.

Unfortunately, there are more things to consider.

Transportation

- canoe
- feet
- horseback
- barge

Lifestyle

- basic subsistence-farming (slash, burn, plant)
- no product market
- self-reliance in all things
- few organized schools
- large families
- short life span (avg. 25 yrs.)

Energy systems

- water in rivers
- wood from forests
- wind for pumping

MAYBE LIFE WASN'T QUITE SO EASY!

When the early settlers began arriving in "DuPazhe" County they found fertile soils, open spaces, clean streams, and all the other elements needed for a good life. However, when Bailey Hobson settled along the DuPage River in 1830 and wanted to build a house there was no lumber yard available. The Hobsons spent their first winter in a tent! Hobson saw the need for finished wood as other settlers moved in and within a few years built DuPage County's first saw mill to meet that need.

The DuPage River offered the first energy system to the settlers in the form of power to run saw mills and grist mills (to grind grain into flour) and just as importantly in the form of transportation (barges and canoes).

1. Did their first energy system work all the time? _____

2. What would happen in the winter months? _____

_____

3. Were there any back up energy systems? _____

_____

4. Why were roads built? _____

_____

5. What were windmills used for?

_____

_____

6. Why didn't the early settlers just use river water? _____

_____

_____

7. Did early settlers worry about conservation? _____

_____

8. Why? or Why not? _____

_____

_____

9. What effect did the invention of the steam engine have on the way people used to live? _____

_____

_____

10. Are all changes and inventions bad? _____

_____

_____

LIFE HAS CERTAINLY CHANGED!

Back in the "good ol' days" we had to depend on ourselves for almost everything we needed. We built our own house, grew our own food, made our own clothes, dug our own well and travelled on our own two feet. How different that all is today! Most of us supply almost none of the things we use or consume in our daily lives. We depend on others to supply our food, clothes, shelter, and transportation. We also depend on energy and machines to do most of our work for us.

Back when the Babcock brothers were settling Babcock's Grove (Lombard) the basic energy sources were the sun, the wind, moving water, wood, and muscles. As machines were invented to make our lives better we began to depend more and more on fossil fuels to supply our energy needs. The fossil fuels are made up of the remains of plants and animals that lived on earth hundreds of millions of years ago.

Compare the two charts.

U.S. Fuel Supply 1900

Coal	74%
Wood	21%
Natural Gas	3%
Oil	2%

U.S. Fuel Supply 1978

Oil	48%
Natural Gas	29%
Coal	18%
Hydroelectric	4%
Nuclear Energy	1%

Why do we use so much natural gas and oil? _____

_____

_____

Why did we stop using wood? _____

_____

_____

What is wrong with coal? _____

_____

_____

_____

HOW MUCH ENERGY DO WE USE?

The United States is the most energy intensive society on the face of the earth. That is, we use more energy to do more things than in any other country. As a result the people in the United States live longer, are healthier, make more money, travel more, read better, and produce more than most any other people.

In an average year the people of the United States use over 75,000,000,000,000,000 Btu's of energy of all kinds!! (That is 75 quadrillion Btu's.) One British thermal unit (Btu) is equal to about the same heat energy in one wooden match. If 75 quadrillion wooden matches were used to make a two inch square stack, the stack would reach all the way to the sun; 93 million miles away.

Another way of measuring our energy use is barrels of oil. In one year the people of the United States use the equivalent of about 13,000,000,000 (13 billion) barrels of oil (42 gallons per barrel). That averages out to about 412 barrels of oil every second!!

Remember, only about one half of the energy we consume is in the form of oil. The other half comes from natural gas, coal, hydroelectric, and nuclear.

Why do we use so much oil? Let us see if we can figure that one out by considering the three big "C's".

Convenience

It is easy to use and we can make so many things from it.

Cost

Up until recently it has been very inexpensive to use.

Clean

Using it has helped clean up our environment and we don't have to work hard to use it- we stay clean.

Any other reasons you can think of?

_____

_____

_____

_____

_____

WHAT'S HAPPENING TO OUR SUPPLY OF ENERGY?

We have not been able to supply all the energy we use as a nation for many years. To make up the difference between what we produce and what we consume we have been importing more and more oil every year. The United States is not the only country that uses large amounts of oil. There are many other countries that need to import (buy) foreign oil and because so many countries are trying to buy the same oil the price has been going up very rapidly.

The supply of oil we have been drawing against cannot be renewed. We cannot make more oil. Oil is a finite or limited resource and once it has been used up there will be no more.

If we can understand how we use our energy maybe we can figure out ways to save some. If we can lower our consumption of energy we might be able to lower the cost of energy as well. Take a look at the chart and see if you can answer the questions.

TOTAL ENERGY USE IN UNITED STATES

Transportation	56%
fuel to run vehicles	25%
energy to build vehicles and maintain roads, airports, etc.	31%
Production factories	11%
Home energy use	19%
space heating	10%
water heating	3%
everything else	6%
Stores and Offices	14%
space heating	7%
air conditioning	2%
everything else	5%
	100%

Which uses the most energy? _____

transportation, factories, home, stores & offices

What uses the most energy in our homes?

_____

space heating, water heating, everything else

Which uses the most energy? _____

fuel to run vehicles, energy to build vehicles and maintain roads, airports, etc.

What energy user should we reduce the most? _____

Find out how much energy your city uses in all of its vehicles and offices.

4.6

WHAT DO WE DO NOW?

When the energy situation becomes clearer, we will begin to understand how much energy we use and how we use it and we will begin to seek solutions to the problems. We begin to point fingers of guilt at those around us. Whose fault is it? Where is the guilty party?

Unfortunately, there is no easy way out of our current problem. In fact, when we begin to look for ways out we run into other problems.

Since so much of our energy is consumed in transportation why don't we just stop using private cars and rely on mass transit systems to carry us around? Then we could close all the automobile factories, tear out all the super highways and freeways, build more railroads and bus lines, and reduce our energy use by about one third.

What is wrong with this solution?

_____

_____

_____

Does the automobile give us any benefits? _____

_____

_____

What about all the people that would be put out of work? _____

_____

What do you think about raising the driving age to 21? _____

_____

Any easy answers?

Raise the price of gasoline and diesel fuel for trucks to $5.00 per gallon. Use the profits to develop alternative energy sources.

Who would suffer the most? _____

_____

_____

Would we as a nation accept that? __

_____

_____

Would this solution really solve the problem? _____

_____

_____

As a city official you must decide on whether to build more streets and parking lots or to build mass transit stations and buy buses. Which course would you take and why? _____

_____

_____

_____

WHAT ABOUT THE FUTURE?

A great many scientists and researchers are studying ways that will help supply our energy for the future. Right here in DuPage County at Argonne Laboratory and at the Fermi Accelerator Laboratory work is going on trying to develop new ways of making energy work for us.

We are trying harder than ever to understand what energy is and how it can be used more efficiently. Right now the energy of the sun and fusion energy seem to be the promise of the future.

Researchers are also working on ways to extract energy from the ocean, the heat of the interior of the earth, garbage, sewerage, the wind, and the radiant energy of the sun. All of these energy systems hold great promise for the future. However, to be able to get to the future we have to understand what we are doing now. We have to make the best use of what we have available. We have to understand how we use each of our available energy sources and we have to make sure that we waste as little as possible.

Each of the energy sources we use should be considered from the cost, benefit, and risk point of view.

Cost: What are the dollar costs of the fuel today and tomorrow? Are there hidden environmental costs? Are there social costs?

Benefit: What does the fuel offer us as benefits? To our economy? To our way of life?

Risk: What are the real risks of using the fuel? Producing it? Refining it? To people? To the environment? What happens if we don't use it?

What do you think would be the best way to encourage people in DuPage County to reduce the amount of energy they consume? _____

_____

_____

If you were a town council member what kinds of laws would you pass to get people to conserve? _____

_____

_____

_____

_____

YOU CAN HELP . . . . RIGHT NOW!

As a student in school in DuPage County there are really quite a few things you can do to help our energy situation.

First, learn as much as you can about energy. Once you really understand the problems we face you may be able to come up with some brand new ideas.

Second, read as much as you can about what is going on in our energy intensive world.

Third, listen carefully to news commentators. Consider what they are saying, do they really know what they are talking about? What is their source of information?

Fourth, save energy whenever and wherever you can. You really have a lot to do with how much energy you use and how much you waste.

Consider the following ideas:

1. If you live close to school, walk or ride your bike, if possible. Don't ask for a ride in the family car.

2. If you can ride a school bus, make sure that you do. Don't ask for a ride in the family car.

3. Combine joy rides with necessary trips.

4. When done using any energy consuming machine, appliance, or light make sure you turn it off.

5. Encourage your parents to follow speed limits.

6. If your family is going to buy a new car recommend the one with the best mileage.

7. Encourage the right thermostat setting at home: 68° winter and 78° summer.

8. When you help with family chores use the least energy possible.

9. Help check for and stop air leaks around the doors and windows of your home.

10. Whenever possible use mass transit systems such as trains or buses.

11. Encourage and help your parents drain two gallons of water out of your water heater at least once a month. It will work more efficiently.

12. Help recycle cans, bottles, and paper. It will save energy and earn you some money.

Having reached this level, the student is now at the point when the decision making role comes into focus. He will be entering the competitive job market as well as assuming a more active role as a consumer. His expanding perspective of the state, the nation, and the world can have, and should have, energy as its focus.

Throughout, history has played an important role in the energy education process as well as consideration of cost, benefit, and risk in determining possible future courses. In considering the various lifestyle choices cost is still an important ingredient. Rather than think in terms of benefit and risk however, it is appropriate to assume a more positive posture and consider advantages and disadvantages.

Because of the varied cross-section of socio-economic backgrounds, it is necessary to concentrate on the major areas in which these students will have an impact such as the home, the type of transportation, and the type of products they need for daily existence. Above all, it is imperative that these students recognize the importance their routine decisions have on energy consumption. The type of car they drive, where they work, the type of dwelling, its location, its construction, and the attitudes they develop toward purchasing products are all critical.

An understanding of economics, the business world, and governmental policies are also an integral part of this approach. As a voter, an employee, and consumer, the student can have an impact or be impacted by these factors of our society. The complexities of our society's interrelationships will become more obvious as the students consider their role today and in the future.

The specific approach for the classroom should be determined by the immediate future of the students - whether they are terminating their formal education or planning for future studies. In either case, the same concepts can be considered. Only the time for actual implementation will vary.

Lifestyle

As you near the end of your career as a student you will be faced with a myriad of decisions which at any one time can seem simple or complex, frightening, or promising, of immediate concern, or far into the future. To help in this decision making process, it is important to consider your way of life today, what you would like it to be tomorrow, and what you must do to attain it.

When you consider your quality of life, begin to establish a frame of reference which is historic and also comparative with regard to people in other nations around the world. At the same time consider the factors which have influenced or determined your present lifestyle and which may or may not continue to do so into the future. Analyze the cost, advantages, and disadvantages of these factors.

In order to establish some guidelines for comparing your lifestyle with that of people living in the past or in other countries you will want to become familiar with gross national product, per capita income, life expectancy, and per capita energy consumption. You may also want to consider major scientific achievements as well as advancements in the humanities and the arts.

Having established a perspective, you are in a better position to begin considering possible courses of action for your future. What kind of job will you want? Where will you want to live? How do you view your needs for transportation? Will you consider energy costs in your role as a consumer? What are your attitudes towards the business community? How active should government be in controlling your lifestyle?

You may feel that you know the answer to each of these questions today, but don't be surprised if your opinions, attitudes, and ideas change as circumstances change or as you yourself change. These kinds of questions will require continual reexamination as you continue to learn and develop.

How will your role as a citizen affect your town's energy use? _____

_____

_____

_____

_____

Jobs

People seek an occupation for a variety of reasons. Whether the job provides a basic standard of living or is a creative outlet is of little consequence when energy consumption is considered. Every occupation is energy intensive. Energy is used to determine the temperature of the buildings, to provide light, to manufacture products, to provide raw materials, for transportation of employees or materials, and for an array of other applications.

As in the past, energy will continue to play a critical role in determining the condition of the job market and will have a definite impact on your chances for employment. As you begin to consider an occupation, it is important to consider the energy sources necessary for your choices and the prospects for continued supplies in the future. This is something people in the recent past did not necessarily have to be concerned with. Also, it is becoming increasingly important to evaluate the location of your home compared to the location of your job while considering the transportation systems available. The cost of transportation compared to income can in fact become a determining factor of where you live or where you work. Likewise, the cost of transportation of raw materials to or finished products from your place of employment may determine if it continues to function there or is moved to a different part of the state or nation.

You must also assess the energy available to operate the facility, the cost of that energy, taxes, and the cost of labor, among other things, when determining the prospects for continued employment. By the way, don't forget the age of the facility or equipment, availability of money, interest rates, present financial condition of the business, impact of government regulations, education or skill requirements, labor relations, and prospects for advancement.

Obviously, deciding on a job, an occupation, or a career is not as simple as it first appears. To help establish a procedure when thinking about your future occupation, make up a form similar to the one following. Include as many factors as possible in order to analyze your prospects. Be as innovative and thorough as you can in filling in the information.

Job Factors	Cost	Advantages	Disadvantages
Type of Job			
Skills Required			
Education Required			
Starting Income			
Prospects for Advancement			
Location of Job			
Transportation To and From			
Union or Non-union			
Product Produced			
Raw Materials Used			
Raw Material Source			
Energy Availability			
Transportation Systems for Products or Raw Materials			
Age of Facility			
Etc., etc., etc.,			

Now that you have some idea of what job factors to consider, where can you find the information?

_____

_____

What services provided by your community are energy intensive?

_____

_____

Can the demands you make on your community for these or additional services be reduced? How?

_____

_____

5.4

Transportation

So you want to buy a vehicle. You already know what you would like, but have you thought about why you want it or how you will use it. Some of the factors to consider are a part of this exercise and should be considered for the following types of vehicles. You can select one from each category.

1. Subcompact (Rabbit, Fiesta, Chevette, Omni, etc.)
2. Compact (Fairmont, Aspen, Dasher, etc.)
3. Full Size (station wagon, sedan, etc.)
4. Van (any kind)
5. Four-wheel drive
6. Luxury (Cadillac, Lincoln, Trans Am, Corvette, etc.)

Factors	1	2	3	4	5	6
Base Cost						
Finance Charge						
Monthly Payment						
Insurance*						
Fuel**						
Oil Change						
Tune Up						
Parts Availability						
Tires						
Options***						
Warranty						

* Base Insurance on highest liability available, collison, comprehensive, uninsured motorist, and $100 deductible.

** Use EPA estimated mileage, 10,000 miles, and $1.25 per gallon.

*** Itemize the cost of the options you would include on a new vehicle.

A place to live is a basic requirement for survival. Whether you rent or own your own home makes little difference when you consider the energy situation. The advantages or disadvantages are the same. The residence can be extremely energy efficient, energy inefficient, or somewhere in between.

To assist you in understanding the energy problems and associated costs in a home, it is important to actually go through the process of planning to build a home. The knowledge you gain will help in making housing decisions in the future.

Start by designing the home which would be ideal for your lifestyle. Obtain a copy of your local or county building code so that your design is realistic with regard to existing regulations. With the design in hand, calculate the cost of construction using $45 per square foot. Assume that you must have 25% down in order to borrow the rest of the money from the bank which charges 10% interest for home mortgages. You now have some idea whether or not you can afford your ideal house. If not, it is time to redesign.

Once you have settled on the house you can afford, it is time to consider where you want to build it, how it will be situated on the lot, what kind of heating system you will use, how much and what kind of insulation to install, what kind of windows to install, etc. Remember, all of these plus many more have energy efficiency as a goal. The less energy required to maintain the house, the less the cost in monthly bills that must be added to the mortgage payments (rent).

Should your community pass ordinances to encourage efficient energy use?

_____ What? _____

_____

_____

How can <u>passive design</u> for your home help to achieve energy conservation?

_____

_____

_____

Consumer Products

As a consumer, you will play an active role for the rest of your life. Your immediate needs may be a stereo, tape deck, television, typewriter, coffee maker, or razor. At some point however, you may consider bigger energy consumers such as a water heater, stove, microwave, freezer, refrigerator, or an air conditioner. Whether you are purchasing small appliances or large items is not really important, but rather what you think about when you are comparing various models.

For example, you are considering an electric knife for yourself or as a gift for a friend. Will it be used regularly? How much energy does it use when operating? How much energy was required to manufacture it? The last question is the most important when compared to the other two. If the knife is used on a regular basis, it will be 20 years before it has consumed as much energy as it took to make it. Does this affect your decision?

Let us assume that you decide against the knife and instead choose an electric razor. Upon considering the same three questions you learn that the razor can be used for 30 years before it will consume the same amount of energy needed to manufacture it. This appears to be even worse than the electric knife unless you consider the alternative, shaving with a blade. How much energy would be used just to provide a sink full of hot water each day?

Compare the appliances on the following chart for the amount of electricity they consume and then consider how much energy is needed to make each item. You will find that it is difficult to obtain hard facts on the energy used to manufacture each item, but common sense can help you with the comparisons.

Finally, make a list of the items from the chart which are absolutely necessary for your lifestyle. Make a second list of the items that are not really necessary, but which are highly desirable to you. Make a third list of the items that you don't need. Find the total Kwh per year of all the items in each list. Multiply each total by $.05. This is the energy cost of each list for one year. Can you as a consumer have an impact on the amount of energy used in this country? Does being a smart consumer have an advantage for you?

FOR YOUR ENERGY INFORMATION-USAGE CHART

The following list of appliances show, in the first column, the average wattage of such an appliance; in the second column, the average number of hours the appliance is used in one year; and in the third column, the total number of kilowatt hours for each appliance over one year.

Appliance	Average Wattage	Average Hours Per Year	Kwh Per Year	Rank[1]
Air cleaner	50	4,320	216	
Air conditioner	1,566	887	1,389	6
Bed covering	177	831	147	
Blanket	177	831	147	
Blender	386	38.9	15	
Broiler	1,436	69.7	100	
Carving knife	92	87	8	
Clock	2	8,500	17	
Clothes dryer	4,856	204	991	
Coffee maker	894	119	106	
Deep fryer	1,448	57.3	83	
Dehumidifier	257	1,467	377	
Egg cooker	516	27	14	
Fan, attic	370	786	291	
Fan, circulating	88	489	43	
Fan, rollaway	171	807	138	
Fan, window	200	850	170	
Floor polisher	305	49.2	15	
Freezer, 15 cu. ft.	445	3,405	1,515	5
Freezer, frostless, 15 cu. ft.	440	4,002	1,761	4
Frying pan	1,196	157	188	
Hair dryer	381	36.7	14	
Heat lamp (infared)	250	52	13	
Heater, portable	1,322	133	176	

5.8

Appliance	Average Wattage	Average Hours Per Year	Kwh Per Year	Rank
Heating pad	65	154	10	
Hot plate	1,257	71.6	90	
Humidifier	177	921	163	
Iron, hand	1,008	143	144	
Mixer	127	102	13	
Oven, microwave	1,500	200	300	
Oven, self clean	4,800	239	1,147	8
Radio	71	1,211	86	
Radio/rcr. player	109	1,000	109	
Range	8,200	128	1,050	10
Refrig. 12 cu. ft.	241	3,021	728	
Refrig/frostless 12 cu. ft.	321	3,791	1,217	7
Refrig/frostless 14 cu. ft.	326	3,448	1,124	9
Regrig/freezer 14 cu. ft.	615	2,947	1,812	3
Roaster	1,333	154	205	
Sandwich grill	1,161	28.4	33	
Sewing machine	75	147	11	
Shaver	14	129	1.8	
Sun lamp	279	57.3	16	
Toaster	1,146	34	39	
Toothbrush	7	7.14	.05	
Trash compactor	400	125	50	
TV, black & white	237	1,527	362	
TV, color	332	1,512	502	
Vacuum cleaner	630	73	46	
Vibrator	40	50	2	
Waffle iron	1,116	19.7	22	
Wash. mach. auto*	521	198	103	
Waste disposer	445	67.4	30	
Water heater	2,475	1,705	4,220	2
Water heater, quick recovery	4,474	1,705	7,628	1
Wash. mach. non-auto*	286	266	76	

* does not include hot water heating

(1) Rank....ten greatest energy consumers in the home

5.9

CONSERVATION CHECKLIST FOR YOUR HOME

This checklist is provide so that you can determine how well your home is conserving heat and energy.

Circle "Y" for YES and "N" for NO.

I. Exterior

Do you . . . . .?

Y N A. Have brick and/or wood siding

Y N B. Have only brick siding

Y N C. Have storm windows

Y N D. Have tight fitting doors and windows

Y N E. Have brick or wood with cracks not caulked

Y N F. Have trees for wind screens and sun protection

Y N G. Have any doors that open toward the North

Y N H. Have storm doors

Y N I. Have insulated glass

Y N J. Have three pane window glass tinted with dead air space between

Y N K. Have awnings over windows

Y N L. Have patio cover

II. Attic or Loft

Do you . . . . ?

Y N A. Have adequate insulation--in attic floor

Y N B. Have ventilators installed in the attic or loft

Y N C. Have vents in the eaves

Y N D. Have circulation fans

Y N E. Have insulation between rafters

Y N F. Have storage in the loft or attic

III. Laundry

Do you . . . . ?

Y N A. Do maximum size loads

Y N B. Use correct temperature settings

Y N C. Use appropriate cycles for fabrics

Y N D. Use cold water where possible (example: rinse with cold)

Y N E. Use proper cycles for size of load

Y N F. Clean lint traps regularly

Y N G. Dry fabrics outside when practical

Y N H. Dry only full loads with dryer

Y N I. Have dryer vented properly

IV. Water Heaters

Do you . . . . ?

Y N A. Drain monthly and remove sediment

Y N B. Have the correct capacity for your home

Y N C. Have controlled temperature settings (140° to 150° best settings for most kitchen and laundry needs)

Y N D. Fix any and all leaky faucets

Y N E. Insulate hot water pipes

Y N F. Watch your use of hot water

Y N 1. Take showers (showers use about half as much hot water as an average tub bath)

Y N 2. Use a dishpan for washing and rinsing when done by hand

Y N 3. Use your dishwasher for storage until you have a full load

Y N 4. Wash your cars or trucks using hot water

V. Central Heating Systems

Do you . . . . ?

Y N A. Have a yearly maintenance service performed on your furnace by professionals

Y N B. Have forced air heat

Y N 1. oil the blower (or grease)

Y N 2. oil the motor (or grease)

Central Heating Systems (continued)

Y N 3. Change or clean the filters frequently (2 times a season is recommended by most furnace manufacturers)

Y N 4. Clean the humidifier

Y N C. Check ducts

Y N 1. For leaks or separations

Y N 2. Have the correct amount of insulation around the pipes or airways

VI. Air Conditioning

Do you . . . . ?

A. Interior

Y N 1. Overcool (under 78°)

Y N 2. Keep air filters clean

Y N 3. Have drapes or furniture obstructing the air flow

Y N 4. Shade window from direct sun in summer with awnings

Y N 5. Close or seal all passages or openings between air conditioned space and the attic or loft including cracks around doors, windows, and stairways

Y N 6. Keep up maintenance of forced air system

Y N a. change filters

Y N b. oil blowers

Y N c. keep condensation

Y N d. block chimneys with draft block or close draft on chimney with any means available

B. Exterior

Y N 1. Maintain outdoor unit for most efficient operation

Y N 2. Cover unit outdoors when not in use

Y N 3. Paint unit

Y N a. grease as required by manufacturer

Y N b. lubricate when required

c. clean extraneous or foreign materials such as grass, straw, sticks. bird nests, etc.

VII. Kitchen

Do you . . . . ?

A. Oven

Y N 1. Preheat too long? (Don't preheat longer than 10 minutes and then only leavened foods and pastry require a preheated oven.)

Y N 2. Try to cook as many things as possible in the oven at the same time

Y N 3. Avoid opening the oven door (Opening the oven door can cause as much as 20% heat loss.)

Y N 4. Avoid using the oven to warm up the room

Y N 5. Use a microwave as often as possible

Y N 6. Use an electric fry pan instead of the oven

Y N 7. Use a slow cooker crock pot

B. Range

Y N 1. Cover pans whenever possible

Y N 2. Avoid violent boiling

Y N 3. Tailor flame or heat settings to size of pan

Y N 4. Use controlled burner whenever possible

Y N 5. Make use of kitchen exhaust fan

How To Calculate the Amount of Electricity Used

Before you can claculate the electricity consumed by your family, you must be able to read the dials of your watt-hour meter. Your meter may have four or five dials. The dials are like the face of a watch but only use the numbers 0 to 9. Every other dial moves counterclockwise. Notice that when the pointer is between two numbers, you read the lower or smallest number.

When the pointer seems to be directly on a number, look to the right; if the pointer on the right side dial has passed "0", then write down the number the pointer seems to be on; if the pointer on the right side dial has not passed "0", then write down the previous lower number on the dial you are recording.

Now, read the dials below.

Did you get 8192? If you did, then you read the meter dials correctly.

RECORD THE READINGS FOR THE FOLLOWING METERS

Meter I

Figure A _____

Figure B _____

Meter II

Figure A _____

Figure B _____

Subtract the number on line A from the number on line B to find the number of Kwh of electricity used.

Meter I		Meter II	
Figure B	_____	Figure B	_____
Figure A	_____	Figure A	_____
Kwh used	_____	Kwh used	_____

5.12

EDUCATIONAL FIELD TRIPS

The reaction of students, teachers, administrators, and boards of education to field trips varies from one of positive promotion to an absolute and flat no. These attitudes are the result of many variables that have come into play as a result of an individual's or group's experiences on previous trips. In any circumstance, the teacher is the key figure and acts as the pivot about which the chances of success or failure of the entire venture revolves. A successful field trip requires a stong commitment from the teacher and a certain amount of extra work with the only rewards often being compliments and the personal satisfaction from doing a good job. Hopefully the suggestions which follow will make field trips a more worthwhile and enjoyable experience for your students and yourself.

GENERAL PHILOSOPHY

Every field trip taken during a school day should be treated as a normal class day with the exception that the classes are not being conducted within the confines of the four walls of the classroom. Because a normal class day will involve math, science, social studies, reading, language arts, and other subjects, as many of these should be included as part of the trip as is practicable.

This is not difficult if you divide the trip into three major parts whenever possible.

1. the bus trip to the site
2. the tour or field experience itself
3. the bus trip back to the school

What is dealt with at the site itself can serve as a starting point for planning the other activities. For example, the trip may be to a place that deals primarily with history. On the bus trip to the site, science, technology, and social issues could be considered and math puzzles and problems could be given on the bus trip back to the school. Reading can be incorporated at anytime and any writing done by the students can be part of a language arts experience. Art may be incorporated in sketches or drawings that the students are required to do.

An absolute must for a good field trip is some kind of book or package of materials for the students to work on. The closer this resembles the kinds of activities in the regular classes, the more likely that the students will associate normal classroom conduct on the tour. The book or package of activities can take many forms depending on the creativity of the teacher and the resources of the building or the district.

Because teachers spend a great deal of time talking to students, it is very important to talk to students during all phases of the trip. This can be difficult on the trip unless some type of public address system is available. This can range from electronic bullhorns or portable types of P.A. systems to systems that are built into the buses.

Finally, the trip itself should relate specifically to a part of the normal curriculum. The optimum situation is to have the trip as a culminating activity for a particular classroom unit. This will allow you to directly relate class activities to experiences that the student will have on the trip. It also makes it easier to receive approval for the trip rather than having it appear that taking the trip is simply for the sake of taking a trip.

BOARD OF EDUCATION

The primary role of the board of education is to put its seal of approval on a field trip either indirectly through policy decisions or through direct involvement in saying "yes" or "no" to a particular trip. At times the board can seem to be a formidable obstacle unless you make them an "offer they can't refuse." With budgets being tightened it appears that boards may be even more difficult to convince on the worth of field trips.

If plans are made well in advance, materials are prepared, and the students realize that a good trip is being planned, it becomes increasingly difficult for board members to hastily say "no" to the trip. It is also very difficult to not recognize the extra individual effort on the part of the teacher. If the board is presented with your plans and materials, you then have a better chance of gaining their blessing and approval.

A field trip also presents a good opportunity for publicity in the local newspaper. This publicity certainly helps build community support for your trip and helps to secure board acceptance. Parents like to see this as do the administrators. This can create the impression that the trip is an annual part of the curriculum rather than just a one-shot deal.

Your students and their parents are one of your most vital assets. After all the plans, the preparation of materials, and the classroom unit, it would be very disappointing to hear that the trip had to be cancelled because of lack of board approval. This can lead to a flood of phone calls seeking an explanation and board members generally find this to be an exasperating experience.

ADMINISTRATION

When dealing with the administration, it is important to have good knowledge of the particular people in your own district. Start where your strongest support will come from whether this is in your building or in the main office. They can help you through a lot of formality, red tape, and the bureaucratic maze. They will hopefully provide positive support when your requisition goes before the board if this is a step in the procedure.

Because administrators are generally very busy they don't often have time to spend in extensive conversations with a teacher about field trip preparations. If, however, you walk in with a package of information and material for the trip, your chances of support are certainly better, particularly if the trip is part of a regular classroom unit.

TEACHERS

Because successful field trips require rather extensive planning and preparations, it is best to work with one or more other teachers. If possible, try to work with a teacher from a subject area other than your own. Be sure to find people who are willing to carry their share of the load or you'll have more to do than is necessary. This may also lead to the development of an interdisciplinary unit which can be a lot of fun and which will present the students with various viewpoints.

STUDENTS

It is vital to the success of the trip to inform the students that they are on tour, not on exhibition. They are going to see rather than to be seen. It is easy to influence the dress of the students if you approach it from the pride and good first impression point of view rather than trying to dictate what the students will wear.

This leads to special rules that apply to the trip itself. It is well and good to have the students share in the formulation of these rules, but unfortunately they don't share in the responsibilities or the liabilities. If the rules are short and clear and the students know they will be enforced, they generally comply with a lot less hassle. If students have shown that they simply can't follow a few basic rules, they should be left at the school.

NOTE: Experience has shown repeatedly that the less time the students spend in souvenir shops, the less the control problems. Shopping trips are altogether different than educational tours.

CHAPERONES

Teachers who actually work on a day to day basis with the students are the best chaperones. They will exercise the necessary authority and make the decisions that are needed in any kind of situation or minor emergency. If these teachers have been involved in the preparations for the trip, they will assume a more active role in chaperoning.

Parents often like to volunteer as chaperones for an entire spectrum of reasons. Unfortunately they often make poor chaperones simply because they have no real authority. They also have no real responsibilities nor share in the liabilities.

PREPARATION FOR THE TRIP

A primary requisite to a good field trip is to actually take the trip well in advance of the one the students are involved in. This will allow you to familiarize yourself with the route you want to take, to meet the people at the place you want to visit to make the necessary arrangements, and most importantly, to gather data and information that can be included in the tour guide. A battery powered tape recorder is an extremely useful tool for this activity.

If you are unfamiliar with the roads that you will be traveling, it may take several trips of several people to gather information about the obeservations for the bus portion of the trip to the site that you will be visiting. This is extremely important because it sets the tone for an educational trip when the students are involved. Making such observations is important because it helps students learn to observe whenever they travel by themselves or with their parents.

After the pretrip, the task of writing the book lies ahead. Try to include enough in the book for the entire day. Also, try to include as much variety as possible. This is much easier if several people are involved in the writing. To help in the preparation of the field trip book some examples of questions and observations have been included.

Once the rough draft is complete, you will have to decide on the method for printing the book. If the book is to be dittoed, a clean typed copy that can be run through the thermofax to produce a master is the best. In this way, the same copy can be used year after year without retyping. This typed copy can also be used to burn a plate for offset printing if this is available in the district. If the book will be run on the mimeograph, it will then be necessary to cut the stencils. This will usually involve the services of a secretary for the typing.

Once the book is in preparation, there are many other things that need attention. Permission letters must be written explaining the trip to the parents. These should include departure and return times if normal bus transportation won't be available, as well as information concerning dress, lunches, and other special provisions. Arrangements must be made for chaperones and also for buses. If at all possible, obtain enough buses so that students can sit two in a seat. Request bus drivers who are interested in the trip and who are willing to help if necessary.

If your district does not have its own buses or lease buses for field trips, it is important to remember that you are in charge and do actually control the route, length of stops, and every aspect of the tour itself. It is also important that you are familiar with the route. Do not assume that the driver knows how to reach your destination. What starts out as a good trip can quickly become a disaster if you get lost.

Sample Energy Experiences

The next few pages are examples of the kinds of experiences in which students at every grade level can participate.

The last six examples are designed to bring students into contact with their respective municipal services. While the included worksheets were designed for intermediate grade students, they can be easily revised up or down as the need arises.

PRIMARY LEVEL ENERGY AWARENESS EXPERIENCE

GOAL: TO EXPLAIN HOW THE SCHOOL BUILDING IS HEATED AND ILLUMINATED.

EXPERIENCE: A WALK THROUGH OF THE SCHOOL BUILDING TO SHOW CIRCUIT BREAKERS OR FUSE BOXES, TRANSFORMERS, FURNACES, VENTILATORS, WATER HEATERS, AND CONTROLS.

SAMPLE OBSERVATIONS:

1. WHERE DOES THE HEAT IN THE CLASSROOM COME FROM? _____

   _____

2. HOW DO WE CONTROL THE TEMPERATURE IN THE ROOM? _____

   _____

3. IS OUR ROOM AIR CONDITIONED? _____

4. HOW DO WE TURN THE LIGHTS ON AND OFF IN OUR ROOM? _____

   _____

5. WHAT IS A FURNACE? _____

   _____

6. WHERE IS THE SCHOOL'S FURNACE? _____

   _____

7. WHAT IS USED TO MAKE THE FURNACE HOT? _____

   _____

8. HOW DO WE MAKE WATER HOT? _____

   _____

9. DOES THE WATER HEATER WORK LIKE THE FURNACE? _____

   _____

10. HOW ARE THE LIGHTS FOR THE WHOLE SCHOOL CONTROLLED? ___

    _____

INTERMEDIATE LEVEL ENERGY AWARENESS EXPERIENCE

GOAL: TO EXPLAIN HOW WE DEPEND ON ENERGY TO SUPPLY OUR DAILY NEEDS.

EXPERIENCE: A WALK THROUGH VISIT TO A LOCAL GROCERY STORE TO POINT OUT ENERGY USED IN STORAGE, HEATING, COOLING, TRANSPORTATION, PACKAGING, AND IN LIGHTING.

EXAMPLE OBSERVATIONS:

1. IS ENERGY USED TO OPEN THE DOORS AS YOU GO INTO THE STORE? _____
2. COUNT THE NUMBER OF LIGHTS HANGING FROM THE CEILING. _____
3. NOW TRY AND COUNT HOW MANY BULBS THERE ARE. _____
4. ARE ANY OF THE PRODUCTS SOLD IN THE STORE MADE OR GROWN RIGHT IN DUPAGE COUNTY? _____ WHAT? _____ _____
5. WHAT PRODUCT DO YOU THINK HAS COME THE FARTHEST? _____ _____ FROM WHERE? _____ _____ HOW DID IT GET TO THE STORE? _____
6. WHICH PRODUCT DO YOU THINK HAS THE MOST PACKAGING? _____ _____
7. WHICH PRODUCT HAS TAKEN THE MOST ENERGY TO MAKE? _____ _____

JUNIOR HIGH LEVEL ENERGY AWARENESS EXPERIENCE

Goal: To demonstrate the complexities and cost in generating one of DuPage County's basic needs: electricity.

Experience: A trip to one of Commonwealth Edison's generating plants. (Fisk, Crawford, or Will County)

Sample Observations:

1. How many generators are in operation in this plant? _____
2. How much electricity can this plant produce? _____
   _____
3. How is the electricity from this plant transmitted? _____
   _____
4. What is the basic energy source used at this plant and where does it come from? _____
   _____
5. How much energy fuel is used in this plant each hour? _____
   _____ each day? _____
6. Do you see any obvious problems at this plant? _____
   _____
7. How much water does this plant use per minute? _____
   _____ per day? _____
8. Where does the water come from? _____
   _____

HIGH SCHOOL ENERGY AWARENESS EXPERIENCE

Goal: To demonstrate the use of energy in manufacturing consumable products.

Experience: A trip to a major manufacturing concern in DuPage County.

Sample Observations:

1. How many people are employed at the plant? _____
2. From what radius does the plant draw its workers? _____
3. What is the average salary range? _____
4. Which two jobs look most interesting to you? _____
5. What mass transportation systems are available to workers at this plant? _____
6. Does this plant participate in or have plans to participate in any van pooling program? _____
7. What transportation systems are used to deliver raw materials or finished products? _____
8. Which tasks do you think require the most energy in completion? ____
   _____
9. What kinds of energy do you see being consumed in the plant? _____
   _____
10. What resource provides most of the energy consumed in this plant? __
    _____
11. What basic raw materials are used by this plant? _____
    _____ From where are they obtained? _____
    _____
12. How much have the plant's energy bills gone up in the last two years?
    _____
13. What has the plant management done to help reduce energy usage in the past year? _____
    _____
14. Why was this locale selected for this plant? _____
    _____
15. How is this plant affected by government regulations? _____
    _____

6.8

LET'S GO VISITING!

A WASTEWATER (SEWAGE) TREATMENT PLANT

TO PROTECT OUR ENVIRONMENT FROM WATER POLLUTION MOST OF DUPAGE COUNTY'S CITIES HAVE BUILT SEWERS WHICH COLLECT THE WASTE WATER FROM HOMES AND FACTORIES. THE SEWERS COLLECT THE WASTE WATER AND CARRY IT TO A PLANT THAT CLEANS THE WATER BEFORE IT IS RETURNED TO THE ENVIRONMENT.

SINCE MOST OF THE WASTE IS ORGANIC (ORIGINALLY PLANT OR ANIMAL MATERIAL) IT CONTAINS A GREAT DEAL OF ENERGY. IT IS POSSIBLE THAT SOME DAY WE MAY BE ABLE TO PRODUCE LARGE AMOUNTS OF ENERGY FROM WHAT IS WASTE TODAY.

TO SEPARATE THE WASTE MATERIAL FROM THE WATER REQUIRES A LOT OF MACHINERY AND ENERGY. WHILE YOU VISIT THE WASTEWATER TREATMENT PLANT SEE IF YOU CAN FIND OUT THE ANSWERS TO THESE QUESTIONS.

WHAT IS THE BIGGEST SOURCE OF WASTE WATER? _____

_____

HOW MANY HOMES DOES THE TREATMENT PLANT SERVE? _____

HOW IS ENERGY USED AT THE PLANT? _____

_____

HOW MUCH ENERGY DOES IT TAKE TO RUN THE PLANT? _____

_____

WHAT KIND OF ENERGY IS (OR COULD BE) PRODUCED AT THE PLANT?

_____

DOES THE TREATMENT PLANT USE ANY OF THE ENERGY IT PRODUCES?

_____

_____

LET'S GO VISITING!

A VILLAGE HALL

MORE AND MORE CITIES IN DUPAGE COUNTY HAVE REALIZED THE NEED TO HAVE ONE CENTRAL OFFICE WHERE THE LEADERS AND MANAGERS OF ALL THE DIFFERENT SERVICES CAN WORK TOGETHER.

THE VILLAGE HALL OR CITY HALL IS WHERE YOU WILL FIND THE MAYOR (OR CITY MANAGER), THE CITY CLERK, THE CITY ENGINEER, THE HEAD OF THE WATER DEPARTMENT, AND OTHER CITY LEADERS. YOU WILL ALSO FIND MEETING ROOMS WHERE CITIZENS CAN COME TO VOICE THEIR IDEAS CONCERNING NEW ORDINANCES (LAWS). THE CITY HALL IS A VERY IMPORTANT PLACE IN THE LIFE OF EVERY CITY AND TOWN.

WHILE YOU VISIT THE VILLAGE OR CITY HALL SEE IF YOU CAN FIND THE ANSWERS TO THESE QUESTIONS.

WHAT OFFICES ARE LOCATED IN THE CITY HALL? (LIST AS MANY AS YOU CAN) _____

_____

_____

WHAT IS THE NAME OF YOUR CITY'S MAYOR (OR MANAGER)? _____

_____

HOW MANY PEOPLE WORK FOR THE CITY? _____

WHAT HAS YOUR CITY DONE TO SAVE ENERGY? _____

_____

WHAT HAS YOUR CITY DONE TO ENCOURAGE OTHER PEOPLE TO SAVE ENERGY?

_____

_____

LET'S GO VISITING!

A PUBLIC WORKS BUILDING

IN THE WINTER WHEN THE SNOW PILES UP, HAVE YOU EVER WONDERED WHERE THE SNOW PLOWS COME FROM? A PUBLIC WORKS BUILDING NOT ONLY STORES SNOW PLOWS FOR THE WINTER BUT IT ALSO IS THE PLACE WHERE ALL THE CITY CARS AND TRUCKS ARE WORKED ON WHEN THEY NEED REPAIRS.

BESIDES A STORAGE YARD AND A REPAIR SHOP THERE ARE USUALLY SOME OFFICES LOCATED IN PART OF THE BUILDING. THE PUBLIC WORKS BUILDING IS VERY IMPORTANT IN KEEPING THE CITY WORKING SMOOTHLY.

WHILE VISITING THE PUBLIC WORKS BUILDING TRY TO FIND THE ANSWERS TO THESE QUESTIONS.

HOW MANY VEHICLES ARE STORED AT THE BUILDING? _____

HOW MANY VEHICLES DOES THE CITY OWN? _____

WHAT PERCENTAGE OF THE VEHICLES ARE CARS? _____

DOES THE CITY OWN HIGH MILEAGE CARS? _____

HOW MUCH ENERGY DOES IT TAKE TO OPERATE THE PUBLIC WORKS BUILDING? _____

HAS THE CITY DONE ANYTHING TO HELP SAVE ENERGY IN THIS BUILDING?

_____ WHAT? _____

_____

LET'S GO VISITING!

A WATER TREATMENT PLANT

EVERY TIME YOU TURN ON A WATER FAUCET HAVE YOU EVER STOPPED TO THINK WHERE THE WATER COMES FROM?

ALL OF THE WATER THAT WE USE COMES FROM THE GROUND. IT IS EITHER PUMPED OUT OF DEEP WELLS OR SPECIAL RESERVOIRS OR FROM NEARBY LAKES, SUCH AS LAKE MICHIGAN.

BEFORE THE WATER TRAVELS TO YOU IT IS TESTED FOR CLEANLINESS AND TREATED WITH SPECIAL CHEMICALS TO MAKE SURE IT IS SAFE FOR YOU TO DRINK.

THE WATER TREATMENT PLANT USES ENERGY TO RUN ITS BIG PUMPS WHICH PUSHES THE WATER THROUGH MILES OF WATER PIPES. ENERGY IS ALSO USED TO HEAT AND OPERATE THE BUILDING.

WHILE YOU ARE VISITING THE PLANT SEE IF YOU CAN FIND OUT THE ANSWERS TO THESE QUESTIONS.

WHERE DOES YOUR CITY'S WATER COME FROM? _____

_____

WHAT CHEMICALS, IF ANY, ARE ADDED TO THE WATER BEFORE YOU USE IT?

_____

HOW MANY VEHICLES (CARS & TRUCKS) ARE OWNED AND OPERATED BY THE PLANT? _____ WHAT ARE THEY USED FOR? _____

_____

HOW MUCH ENERGY DOES IT TAKE TO OPERATE THE WATER TREATMENT PLANT?

_____

LET'S GO VISITING!

A POLICE STATION

CAN YOU IMAGINE WHAT LIFE WOULD BE LIKE IF WE HAD NO POLICE OFFICERS TO HELP US?

THERE WOULD BE NO ONE TO CALL IF WE GOT INTO TROUBLE! WHO WOULD HELP US CROSS THE STREETS WHEN THEY WERE BUSY WITH CARS?

POLICE OFFICERS HELP KEEP LAW AND ORDER. WHILE YOU ARE VISITING THE POLICE STATION SEE IF YOU CAN FIND THE ANSWERS TO THESE QUESTIONS.

WHAT IS A RADIO ROOM? _____

_____

WHAT KIND OF RADIOS DO THE POLICE USE? _____

_____

WHY DO THEY USE RADIOS? _____

_____

HOW MANY CARS DO THE POLICE HAVE? _____

WHAT IS THE MAIN USE OF THE CARS? _____

_____

DO THE POLICE CARS HAVE BIG ENGINES OR SMALL ENGINES? _____

_____ WHY? _____

HOW MANY POLICE OFFICERS WORK OUT OF THE STATION? _____

WHAT KIND OF ENERGY DOES THE POLICE STATION USE TO KEEP WARM DURING THE WINTER? _____

HAVE THEY DONE ANYTHING TO HELP SAVE ENERGY AT THE POLICE STATION?

_____ WHAT? _____

_____

LET'S GO VISITING!

A FIRE STATION

ONE OF THE MOST IMPORTANT SERVICES A TOWN CAN OFFER ITS CITIZENS IS PROTECTION FROM FIRE. A RAGING FIRE IN A HOME OR IN A STORE IS SURE TO CAUSE GREAT DAMAGE UNLESS HELP ARRIVES QUICKLY.

SOME TOWNS HAVE FULL-TIME PAID FIREFIGHTERS BUT MANY HAVE VOLUNTEERS. THE VOLUNTEERS HAVE OTHER JOBS BUT AS SOON AS THE FIRE SIREN SOUNDS OFF THEY LEAVE THEIR JOBS OR HOMES AND RUSH TO THE FIRE STATION.

THE FIREFIGHTERS AND THEIR EQUIPMENT MUST BE ABLE TO ANSWER THE CALL FOR HELP ANYTIME OF THE DAY OR NIGHT.

WHILE YOU VISIT THE FIRE STATION SEE IF YOU CAN FIND THE ANSWERS TO THESE QUESTIONS.

ARE THE FIREFIGHTERS FULL-TIME OR VOLUNTEER? _____

DO THE FIREFIGHTERS CARRY PERSONAL RADIOS? _____ WHY OR WHY NOT? _____

_____

WHAT KINDS OF VEHICLES DO YOU SEE AT THE FIRE STATION? _____

_____

WHICH IS THE MOST IMPORTANT VEHICLE? _____

DO ALL THE VEHICLES AT THE STATION USE A LOT OF ENERGY? _____

COULD WE AFFORD TO STOP USING THESE PEOPLE AND THEIR VEHICLES JUST TO SAVE ENERGY? _____

WHAT DO YOU THINK THEY COULD DO TO SAVE ENERGY? _____

_____

ENERGY FIELD TRIP SITES

The following pages include pertinent information on specific sites in or near to DuPage County which relate to energy production, consumption, and conservation.

It is intended that as each teacher becomes involved in teaching energy a site demonstrating a set of concepts would be visited to help the students visualize the total nature of the problem as well as potential solutions.

It is suggested that each teacher become acquainted with the potential sites and their possible applications as a teaching tool.

It is important that each site be reviewed carefully for each have different problems which may make their use inappropriate.

It is assumed that numerous other sites may be developed by individual teachers. To help record needed information a blank site form is included, suitable for easy reproduction.

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site _____
2. Location _____
3. Purpose of trip: _____

   _____
4. Description of visable energy aspects: _____

   _____
5. Contact person: Name _____ Postion _____

   Address _____ Phone _____

   _____
6. Alternate Contact: Name _____ Phone _____
7. Registration Process:

   Phone call will do ____

   Permission request letter ____ To whom? _____

   How much advance notice is needed? _____

   Arrival/departure times _____
8. Facilities:

   Washrooms? ____ No. ____ Lunchroom? ____ Capacity ____

   Parking availability _____

   Special problems _____
9. Security:

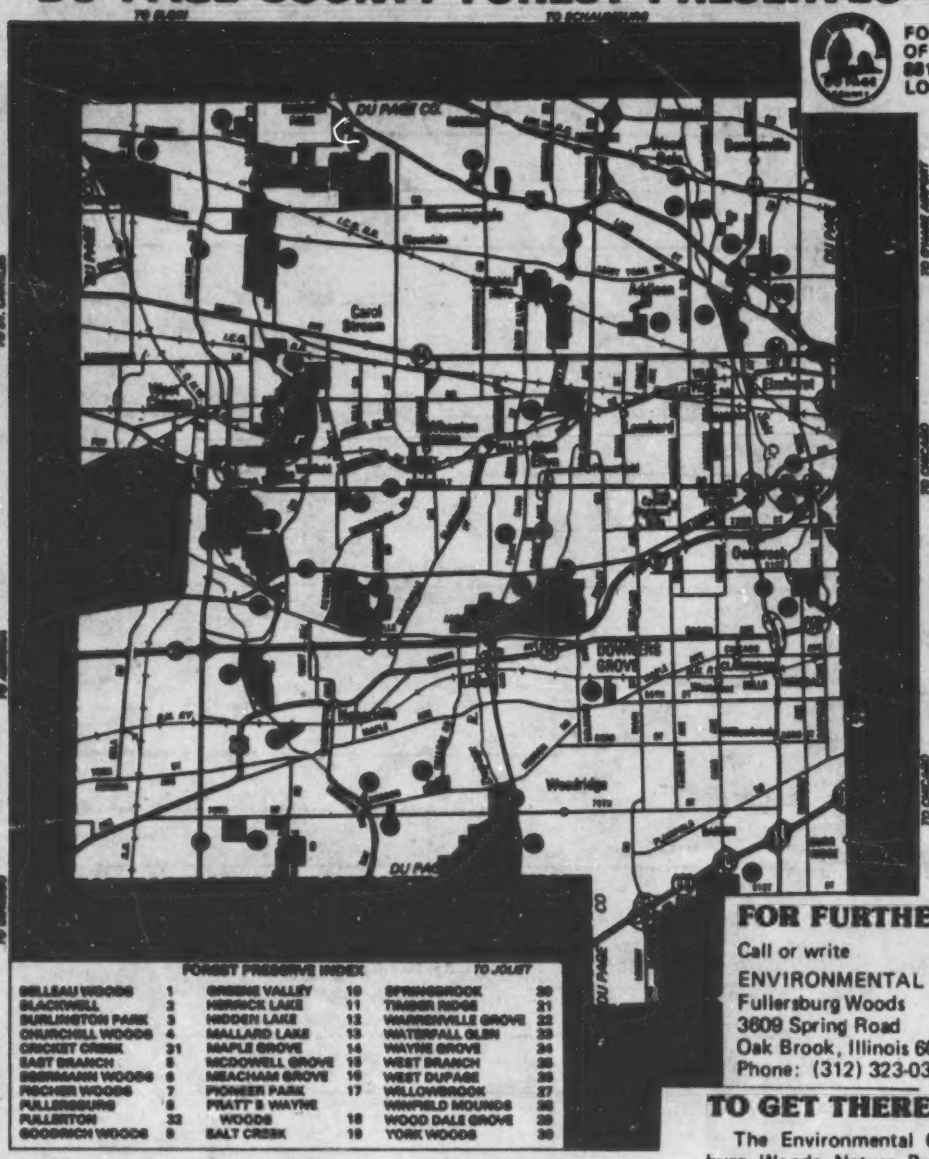
   Age restrictions? ____ What? ____ Group Size: Minimum ____ Maximum ____

   Hard hats? ____ Chaperones? ____ Restricted areas? _____
10. Cost:

    Entry fees? _____ Materials? _____
11. Comments:

DU PAGE COUNTY FOREST PRESERVES

FOREST PRESERVE DISTRICT
OF DU PAGE COUNTY
601 W. ST. CHARLES ROAD
LOMBARD, ILLINOIS 60148



FOREST PRESERVE INDEX

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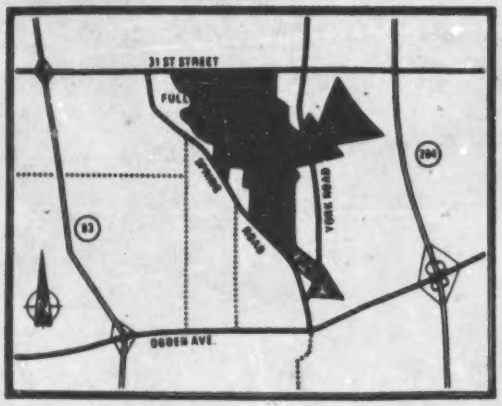
FOR FURTHER INFORMATION

Call or write

ENVIRONMENTAL EDUCATION CENTER
Fullersburg Woods
3609 Spring Road
Oak Brook, Illinois 60521
Phone: (312) 323-0389

TO GET THERE.....

The Environmental Center is located in Fullersburg Woods Nature Preserve. The entrance is on Spring Road, one mile south of 31st Street or 1/3 mile north of the Graue Mill.



DuPage County is lucky enough to have thousands of acres of forest preserves and nature areas which can be used by teachers regardless of grade level.

It was realized long ago that "green space" should be preserved for both recreation and education. The Environmental Education Center at Fullersburg Woods has been especially set aside to teach environmental concepts to students of all ages. If at all possible be sure to include this important aspect in your future plans.

7.3

ENERGY FIELD TRIP SITE SELECTION FORM

1. **Name of site** *Supplemental Fuel Plant of the Metropolitan Sanitary District*
2. **Location** *¼ mile north of I-55, 1/8 mile east of Pulaski Road*
3. **Purpose of trip:** *To view technological handling of garbage as an energy source.*
4. **Description of visable energy aspects:** *collection costs, fuel handling, pollution control, etc.*
5. **Contact person:** **Name** *Emil Nigro* **Postion** *Supervising Engineer*
   Address _____ **Phone** *312-744-3181*
6. **Alternate Contact:** **Name** _____ **Phone** _____
7. **Registration Process:**
   Phone call will do *X*
   Permission request letter _____ **To whom?** _____
   How much advance notice is needed? *four weeks*
   Arrival/departure times *9:30 am - 3:30 pm*
8. **Facilities:**
   Washrooms? *Yes* **No.** *2* **Lunchroom?** *No* **Capacity** ____
   Parking availability *One bus*
   Special problems _____
9. **Security:**
   Age restrictions? *No* **What?** ____ **Group Size:** **Minimum** *None* **Maximum** *None*
   Hard hats? *No* **Chaperones?** *Yes* **Restricted areas?** *Yes*
10. **Cost:**
    Entry fees? *None* **Materials?** *Some*
11. **Comments:**

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site Union Oil Refinery
2. Location Romeoville Road; between Rt. 53 & New Avenue, Romeoville, Ill.
3. Purpose of trip: To view oil refining process
4. Description of visable energy aspects: cracking process, fuel handling, fuel storage, transportation, pollution control
5. Contact person: Name Ron Runge Postion Plant Manager
   Address _____ Phone 312-257-7761
6. Alternate Contact: Name Jeff Wilkes Phone 312-257-7761
7. Registration Process:
   Phone call will do X
   Permission request letter ____ To whom? _____
   How much advance notice is needed? two weeks
   Arrival/departure times generally betweeen 9:00 am - 3:00 pm
8. Facilities:
   Washrooms? Yes No. 2 Lunchroom? Yes Capacity 45
   Parking availability No problems
   Special problems No pictures; may leave bus only at designated places
9. Security:
   Age restrictions? Yes What? ___ Group Size: Minimum ____ Maximum ____
   Hard hats? No Chaperones? Yes Restricted areas? Yes
10. Cost:
    Entry fees? None Materials? Some
11. Comments:

ENERGY FIELD TRIP SITE SELECTION FORM

1. **Name of site** Southwest Sewerage Plant of the Metropolitan Sanitary District
2. **Location** ½ mile north of I-55 on Pershing Road; one mile east of Harlem Ave.
3. **Purpose of trip:** To view potential alternate energy site and gain an understanding of municipal waste handling
4. **Description of visable energy aspects:** creation of methane gas, anaerobic digestion, energy cost of waste handling, pollution control, etc.
5. **Contact person:** Name Barbara Rumsey Postion _____
   Address _____ Phone 312-751-5600
6. **Alternate Contact:** Name _____ Phone _____
7. **Registration Process:**
   Phone call will do _____
   Permission request letter X To whom? Hugh H. McMillan (address below)
   How much advance notice is needed? two weeks
   Arrival/departure times 9:30 am - 3:30 pm
8. **Facilities:**
   Washrooms? Yes No. 2 Lunchroom? Yes Capacity 20
   Parking availability One bus
   Special problems _____
9. **Security:**
   Age restrictions? No What? ____ Group Size: Minimum None Maximum None
   Hard hats? No Chaperones? Yes Restricted areas? Yes
10. **Cost:**
    Entry fees? None Materials? None
11. **Comments:**

Hugh H. McMillan
General Superintendent
Metropolitan Sanitary District
100 East Erie Avenue
Chicago, Illinois 60611

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Chicago Museum of Science and Industry*
2. Location *57th Street and South Lake Shore Drive*
3. Purpose of trip: *To view a variety of displays on energy systems*
4. Description of visable energy aspects: *coal, nuclear, fusion, solar, petroleum, and natural gas*
5. Contact person: Name *Victor Danilov* Postion *Director*
   Address _____ Phone *312-684-1414*
6. Alternate Contact: Name _____ Phone _____
7. Registration Process:
   Phone call will do *X*
   Permission request letter ____ To whom? _____
   How much advance notice is needed? *at least one week*
   Arrival/departure times *9:30 am - 5:30 pm*
8. Facilities:
   Washrooms? *Yes* No. ____ Lunchroom? *Yes* Capacity ____
   Parking availability *No problems*
   Special problems _____
9. Security:
   Age restrictions? *No* What? ____ Group Size: Minimum *None* Maximum *None*
   Hard hats? ____ Chaperones? *Yes* Restricted areas? *None*
10. Cost:
    Entry fees? *None* Materials? *Some*
11. Comments:

Chaperones: 1 for every 10 students
Pop available at 40-45¢ for sack lunches

Entry fee for coal mine & submarine:
25¢ for every 10 students
chaperone free

7.7

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Commonwealth Edison Will County Generating Station*
2. Location *Romeoville Road; between Rt. 53 and New Avenue, Romeoville, Ill.*
3. Purpose of trip: *To witness electrical generation, fuel handling, pollution control and energy management*
4. Description of visable energy aspects: *coal utilization, water management, generators, turbines, steam pressure, transportation sytems, etc.*
5. Contact person: Name *Orville Mallett* Postion *Personnel Supervisor*
   Address _____ Phone *815-838-2140*
6. Alternate Contact: Name *Bob McShane* Phone *312-294-3060*
7. Registration Process:
   Phone call will do *X*
   Permission request letter ____ To whom? _____
   How much advance notice is needed? *two weeks*
   Arrival/departure times *generally between 9:00 am - 3:00 pm*
8. Facilities:
   Washrooms? *Yes* No. *2* Lunchroom? *Yes* Capacity *40*
   Parking availability *On grounds - one school bus*
   Special problems _____
9. Security:
   Age restrictions? *Yes* What? *4th gr.* Group Size: Minimum *10* Maximum *45*
   Hard hats? *Yes* Chaperones? *Yes* Restricted areas? *Yes*
10. Cost:
    Entry fees? *None* Materials? *Some*
11. Comments:

ENERGY FIELD TRIP SITE SELECTION FORM

1. **Name of site** Commonwealth Edison Crawford Generating Station
2. **Location** Pulaski Road, Chicago - ½ mile north of I-55
3. **Purpose of trip:** To witness electrical generation, fuel handling, pollution control and energy management
4. **Description of visable energy aspects:** coal utilization, water management, generators, turbines, steam pressure, transportation systems, etc.
5. **Contact person:** Name H. Toci Postion Superintendent
   Address _____ Phone 312-247-7272 ext. 212
6. **Alternate Contact:** Name Bob McShane Phone 312-294-3060
7. **Registration Process:**
   Phone call will do X
   Permission request letter ____ To whom? _____
   How much advance notice is needed? two weeks
   Arrival/departure times 9:00 am - 3:00 pm
8. **Facilities:**
   Washrooms? Yes No. 2 Lunchroom? Yes Capacity 45
   Parking availability one bus
   Special problems _____
9. **Security:**
   Age restrictions? yes What? 4th gr. Group Size: Minimum 10 Maximum 45
   Hard hats? Yes Chaperones? Yes Restricted areas? Yes
10. **Cost:**
    Entry fees? None Materials? Some
11. **Comments:**

7.9

ENERGY FIELD TRIP SITE SELECTION FORM

1. **Name of site** Commonwealth Edison Fisk Generating Station
2. **Location** 1111 W. Cermak, Chicago ; two miles southwest of the Chicago loop
3. **Purpose of trip:** To witness electrical generation, fuel handling, pollution control and energy management
4. **Description of visable energy aspects:** coal utilization, water management, generators, turbines, steam pressure, tansportation systems, etc.
5. **Contact person:** Name _____ Postion Superintendent
   Address _____ Phone 312-738-4122 ext. 212
   _____
6. **Alternate Contact:** Name Bob McShane Phone 312-294-3060
7. **Registration Process:**
   Phone call will do X
   Permission request letter ____ To whom? _____
   How much advance notice is needed? two weeks
   Arrival/departure times 9:00 am - 3:00 pm
8. **Facilities:**
   Washrooms? Yes No. 2 Lunchroom? Yes Capacity 45
   Parking availability one bus
   Special problems _____
9. **Security:**
   Age restrictions? Yes What? 4th gr. Group Size: Minimum 10 Maximum 45
   Hard hats? Yes Chaperones? Yes Restricted areas? Yes
10. **Cost:**
    Entry fees? None Materials? Some
11. **Comments:**

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site Commonwealth Edison Dresden Generating Station
2. Location Lorenzo Road, one mile west of I-55; 20 miles south of Joliet
3. Purpose of trip: To witness electrical generation, fuel handling, pollution control, and energy management
4. Description of visable energy aspects: nuclear reactor models and related systems
5. Contact person: Name Donald Bromley Postion _____
   Address _____ Phone 815-942-2920 ext. 225
6. Alternate Contact: Name Bob McShane Phone 312-294-3060
7. Registration Process:
   Phone call will do X
   Permission request letter ____ To whom? _____
   How much advance notice is needed? two weeks
   Arrival/departure times 9:00 am - 3:00 pm
8. Facilities:
   Washrooms? Yes No. 2 Lunchroom? Yes Capacity 45
   Parking availability one bus
   Special problems _____
9. Security:
   Age restrictions? No What? ____ Group Size: Minimum No Maximum 45
   Hard hats? No Chaperones? Yes Restricted areas? Yes
10. Cost:
    Entry fees? None Materials? Some
11. Comments:

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site Argonne National Research Laboratory
2. Location Cass Avenue; one mile south of I-55 in Argonne, Ill.
3. Purpose of trip: To view basic research laboratory.

4. Description of visable energy aspects: solar research, coal combustion, pollution control, etc.
5. Contact person: Name Al Krisciunas Postion
   Address 9700 South Cass Avenue Phone 312-972-2773
   Argonne, Illinois 60439
6. Alternate Contact: Name Phone
7. Registration Process:
   Phone call will do
   Permission request letter X To whom? A.B. Krisciunas
   How much advance notice is needed? two weeks
   Arrival/departure times 9:00 am or 1:30 pm tours
8. Facilities:
   Washrooms? Yes No. 4 Lunchroom? Yes Capacity 100
   Parking availability yes
   Special problems
9. Security:
   Age restrictions? Yes What? 16 Group Size: Minimum Maximum 15
   Hard hats? No Chaperones? No Restricted areas? Yes
10. Cost:
    Entry fees? None Materials? None
11. Comments:

7.12

ENERGY FIELD TRIP SITE SELECTION FORM

1. **Name of site** Fermi National Accelerator Laboratory
2. **Location** Kirk Road; one mile north of Butterfield Road (Rt. 56), Batavia, Ill.
3. **Purpose of trip:** To view latest high level research in physics
4. **Description of visable energy aspects:** models, diagrams, and slides concerning accelerator physics
5. **Contact person:** Name Mrs. Patricia Zack Postion
   Address P.O. Box 500 Phone 312-840-3351
   Batavia, Illinois 60510
6. **Alternate Contact:** Name Phone
7. **Registration Process:**
   Phone call will do ____
   Permission request letter X To whom? Mrs. Patricia Zack
   How much advance notice is needed? two - three weeks
   Arrival/departure times guided tours at 9:30 am or 1:30 pm
8. **Facilities:**
   Washrooms? Yes No. 2 Lunchroom? Yes Capacity ____
   Parking availability on right hand side of high rise
   Special problems
9. **Security:**
   Age restrictions? Yes What? 14 Group Size: Minimum ____ Maximum ____
   Hard hats? ____ Chaperones? Yes Restricted areas? Yes
10. **Cost:**
    Entry fees? None Materials? Some
11. **Comments:**
    Self guided tours for 6 or less people
    Guided tours of 10 people or more
    Lunchroom available after 1:00 pm for morning tours

7.13

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Village of Bloomingdale*
2. Location *201 S. Bloomingdale Road*
3. Purpose of trip: *to inspect all village facilities*
4. Description of visable energy aspects: _____
5. Contact person: Name *Robert Mundo* Postion *Director, Public Works*
   Address *same as above* Phone *893-7000 ext. 53*
6. Alternate Contact: Name _____ Phone _____
7. Registration Process:
   Phone call will do *X*
   Permission request letter ____ To whom? _____
   How much advance notice is needed? *one to two days*
   Arrival/departure times *7 am - 3:30 pm*
8. Facilities:
   Washrooms? *yes* No. ____ Lunchroom? *yes* Capacity *25*
   Parking availability _____
   Special problems _____
9. Security:
   Age restrictions? ____ What? ____ Group Size: Minimum *20* Maximum ____
   Hard hats? *yes* Chaperones? *yes* Restricted areas? *yes*
10. Cost:
    Entry fees? *none* Materials? _____
11. Comments:

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Lab-Tek Division, Miles Laboratories, Inc.*
2. Location *30 W 475 N. Aurora Road, Naperville, Illinois 60540*
3. Purpose of trip: _____
4. Description of visable energy aspects: _____
5. Contact person: Name *William G. Wellinghoff* Postion *Manager, Personnel*
   Address *same as above* Phone *357-3720*
6. Alternate Contact: Name *Diane Flick* Phone *357-3720*
7. Registration Process:
   Phone call will do *X*
   Permission request letter ____ To whom? _____
   How much advance notice is needed? *two weeks*
   Arrival/departure times *to be determined*
8. Facilities:
   Washrooms? *yes* No. *4* Lunchroom? *yes* Capacity *50*
   Parking availability *ample*
   Special problems *none*
9. Security:
   Age restrictions? *yes* What? *10 yrs* Group Size: Minimum *10* Maximum *25*
   Hard hats? *no* Chaperones? *yes* Restricted areas? *yes*
10. Cost:
    Entry fees? _____ Materials? _____
11. Comments:
    length of tour and explanation will take approximately 45 minutes

7.15

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Hinsdale Sanitary District*
2. Location *6975 Commonwealth Avenue Burr Ridge*
3. Purpose of trip: *to observe wastewater treatment*
4. Description of visable energy aspects: *reuse of digester gases for heat exchanger*
5. Contact person: Name *Carl Blomgren* Postion *Executive Director*
   Address *P.O. Box 179* Phone *323-3299*
   Hinsdale, Illinois 60521
6. Alternate Contact: Name _____ Phone _____
7. Registration Process:
   Phone call will do *X*
   Permission request letter ____ To whom? _____
   How much advance notice is needed? *one week*
   Arrival/departure times *9 am - 3 pm*
8. Facilities:
   Washrooms? *yes* No. ____ Lunchroom? *yes* Capacity *40*
   Parking availability _____
   Special problems _____
9. Security:
   Age restrictions? ____ What? ____ Group Size: Minimum ____ Maximum *50*
   Hard hats? *no* Chaperones? *yes* Restricted areas? *none*
10. Cost:
    Entry fees? *none* Materials? *none*
11. Comments:
    one chaperone for every ten students

7.16

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Wheaton Sanitary District Wastewater Treatment Plant*
2. Location *1 South 640 Shaffner Road, Wheaton, Illinois*
3. Purpose of trip: _____

   _____
4. Description of visable energy aspects: *sewage pumps, large centrifugal air compressor, methane gas production, and use in anaerobic digesters*
5. Contact person: Name *Robert L. Clavel* Postion *Manager*

   Address *P.O. Box 626* Phone *668-1515*

   Wheaton, Illinois
6. Alternate Contact: Name *Michael Childs* Phone *668-1511*
7. Registration Process:

   Phone call will do *X*

   Permission request letter ____ To whom? _____

   How much advance notice is needed? *two weeks*

   Arrival/departure times *mid morning or early afternoon*
8. Facilities:

   Washrooms? *yes* No. ____ Lunchroom? *no* Capacity ____

   Parking availability *large area available*

   Special problems _____
9. Security:

   Age restrictions? *yes* What? *10 yrs* Group Size: Minimum *10* Maximum *30*

   Hard hats? *no* Chaperones? *yes* Restricted areas? *no*
10. Cost:

    Entry fees? *none* Materials? _____
11. Comments:

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Village of Bensenville Wastewater Treatment Plant*
2. Location *711 E. Jefferson, Bensenville, Illinois*
3. Purpose of trip: *to understand the purpose of a wastewater treatment facility and to understand how it works*
4. Description of visable energy aspects: *reclaiming the water to use on the landscape, park district*
5. Contact person: Name *Larry Grage* Postion *Plant Supervisor*
   Address *700 W. Irving Park* Phone *766-1960*
   Bensenville, Ill. 60106
6. Alternate Contact: Name *Robert Weipert* Phone *766-3132*
7. Registration Process:
   Phone call will do *X*
   Permission request letter ____ To whom? ____
   How much advance notice is needed? *one week at least*
   Arrival/departure times *anytime between 9:00 am and 3:00 pm*
8. Facilities:
   Washrooms? *yes* No. ____ Lunchroom? *yes* Capacity *35-40*
   Parking availability *plenty of parking around plant*
   Special problems ____
9. Security:
   Age restrictions? *yes* What? *10 yrs* Group Size: Minimum ____ Maximum *up to 100*
   Hard hats? *no* Chaperones? *yes* Restricted areas? *close to the tanks*
10. Cost:
    Entry fees? *none* Materials? ____
11. Comments:

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Village of Addison Waste Water Treatment Plant*
2. Location *333 S. Villa Avenue, Addison, Illinois 60101*
3. Purpose of trip: *to observe purification of waste water*
4. Description of visable energy aspects: _____
5. Contact person: Name *Gregory Brunst* Postion *Asst. Supt. WPCD*
   Address *333 S. Villa Avenue* Phone *543-4100 ext. 52*
6. Alternate Contact: Name _____ Phone _____
7. Registration Process:
   Phone call will do ____
   Permission request letter *yes* To whom? *Gregory J. Brunst*
   How much advance notice is needed? *one month*
   Arrival/departure times *9:00 am - 3:00 pm*
8. Facilities:
   Washrooms? *yes* No. ____ Lunchroom? *no* Capacity ____
   Parking availability *very limited at present, adequate early 1980*
   Special problems *no tour availability prior to June 1980 due to current construction*
9. Security:
   Age restrictions? *yes* What? *9 yrs* Group Size: Minimum *10* Maximum *50*
   Hard hats? *no* Chaperones? *yes* Restricted areas? *yes*
10. Cost:
    Entry fees? *none* Materials? *none*
11. Comments:

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Carol Stream Wastewater Reclamation Plant*
2. Location *280 Arrowhead, Carol Stream, Ill. 60187*
3. Purpose of trip: *to view process of wastewater treatment*
4. Description of visable energy aspects: *recycling of wastewater to ensure the natural environment*
5. Contact person: Name *Karl Merbach* Postion *Lab Technician*
   Address *415 N. Gary Avenue* Phone *668-6161*
   Carol Stream, Ill. 60187
6. Alternate Contact: Name *Glenn Schnulle* Phone *668-6161*
7. Registration Process:
   Phone call will do *X*
   Permission request letter ____ To whom? ____
   How much advance notice is needed? *one week*
   Arrival/departure times *anytime between 9am - 3 pm*
8. Facilities:
   Washrooms? *yes* No. ____ Lunchroom? *no* Capacity ____
   Parking availability *good*
   Special problems ____
9. Security:
   Age restrictions? ____ What? ____ Group Size: Minimum *1* Maximum *40*
   Hard hats? ____ Chaperones? ____ Restricted areas? ____
10. Cost:
    Entry fees? *none* Materials? ____
11. Comments:
    the tour will last approximately one hour; more understandable for ages 10 years and up.

7.20

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site Lockformer Company
2. Location 711 Ogden Avenue, Lisle, Illinois 60532
3. Purpose of trip: _____
4. Description of visable energy aspects: recycling of energy heat facility
5. Contact person: Name Carol A. Kowaleski Postion Personnel Dept.
   Address 711 Ogden Avenue Phone 964-8000 Ext. 73
   Lisle, Illinois 60532
6. Alternate Contact: Name E.C.A. Adams Phone 964-8000 Ext. 72
7. Registration Process:
   Phone call will do ____
   Permission request letter X To whom? C.A. Kowaleski
   How much advance notice is needed? one week
   Arrival/departure times 10:45 arrival time: Departure - time needed
8. Facilities:
   Washrooms? X No. ____ Lunchroom? no Capacity ____
   Parking availability limited
   Special problems _____
9. Security:
   Age restrictions? ____ What? ____ Group Size: Minimum ____ Maximum ____
   Hard hats? no Chaperones? yes Restricted areas? some
10. Cost: n/a
    Entry fees? n/a Materials? none
11. Comments:
    group size would be determined by the age group touring

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site Ball Seed Company
2. Location West Chicago, Illinois 60185
3. Purpose of trip: to expose horticulture students or adults to a production area of Ghse products
4. Description of visable energy aspects: heating and cooling controls for Ghses, lap-seal retention system
5. Contact person: Name Sales Service Dept. Postion _____
   Address 250 Town Road Phone 231-3500
   West Chicago, Ill.
6. Alternate Contact: Name _____ Phone _____
7. Registration Process:
   Phone call will do X
   Permission request letter ____ To whom? _____
   How much advance notice is needed? approximately one month
   Arrival/departure times 45 minute tour (approx.) - to be arranged between 9am - 4:30 pm Mon-Fri
8. Facilities:
   Washrooms? Yes No. ____ Lunchroom? no Capacity ____
   Parking availability flexible
   Special problems _____
9. Security:
   Age restrictions? Yes What? ____ Group Size: Minimum 5 Maximum 20
   Hard hats? no Chaperones? yes Restricted areas? tour area only
10. Cost:
    Entry fees? none Materials? none
11. Comments:
    Junior & senior high school students in horticulture only.

ENERGY FIELD TRIP SITE SELECTION FORM

1. Name of site *Spraying Systems Company*
2. Location *North Avenue at Schmale Road, Wheaton, Ill. 60187*
3. Purpose of trip: _____
4. Description of visable energy aspects: *heating, air conditioning, use of cutting or cooling oils, use of recycled paper products*
5. Contact person: Name *Elmer H. Reu* Postion *Personnel Director*
   Address *(same as above)* Phone *665-5000 ext. 338*
6. Alternate Contact: Name *Don A. Zalewa* Phone *665-5000 ext. 337*
7. Registration Process:
   Phone call will do ____
   Permission request letter *X* To whom? *Same as above*
   How much advance notice is needed? *one week*
   Arrival/departure times *no special time*
8. Facilities:
   Washrooms? *X* No. *8* Lunchroom? *X* Capacity *150*
   Parking availability _____
   Special problems *none*
9. Security:
   Age restrictions? *yes* What? *16* Group Size: Minimum *12* Maximum *50*
   Hard hats? *No* Chaperones? ____ Restricted areas? *none*
10. Cost:
    Entry fees? *none* Materials? _____
11. Comments:

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ENERGY INFORMATION RESOURCE LIST

United States Department of Energy

Technical Information Center
Post Office Box 62
Oak Ridge, Tennessee 37830

The Technical Information Center (TIC) is the collection, processing, and distribution point for scientific and technical information generated by the Department of Energy. It provides extensive technical reference services and document and film request services, and carries out an educational services program devoted to aiding students and teachers at all levels in their studies of energy. For detailed information on specific services, write TIC at the above address. For a listing of films available on free loan, ask for the Energy Films Catalog; for a listing of free booklets and curriculum materials, ask for the Selected Department of Energy Publications. Specific titles to request include:

NSTA Instructional Packets

1. How a Bill Becomes a Law to Conserve Energy Grades 9, 11, 12
2. Agriculture, Energy, and Society Grades 10-12
3. Energy, Engines, and the Industrial Revolution Grades 8 & 9
4. Transportation and the City Grades 8 & 9
5. Community Workers and the Energy They Use Grades 2 & 3
6. The Energy We Use Grades 1 & 2
7. Energy and Transportation Grades 3-5
8. Mathematics in Energy Grades 7 & 8
9. U.S. Energy Policy - Which Direction Grades 11 & 12
10. Energy Transitions in United States History Grades 8 & 9
11. Networks: How Energy Links People, Goods, and Services Grades 4 & 5
12. Bringing Energy to the People: Ghana and the U.S. Grades 6 & 7
13. Energy in the Global Marketplace Grades 9-11
14. Two Energy Gulfs Grades 6 & 7
15. The New Westward Movement Grade 11

Your Energy World - an intermediate grade level ditto master set and poster with a non-science emphasis.

Energy Conservation in the Home: An Energy Education/Conservation Curriculum Guide for Home Economics Teachers - practical information for immediate use in conserving energy.

The Energy Challenge - good activities for local demonstrations and talks.

U.S. Department of Energy (continued):

Science Activities in Energy: Intermediate

Wind Energy

Energy Conservation

Chemical Energy

Solar Energy

Solar Energy II (for high school students)

Electrical Energy

U.S. Department of Agriculture

Washington, D.C. 20250

A Guide to Energy Savings for the Dairy Farmer

A Guide to Energy Savings for the Poultry Producer

A Guide to Energy Savings for the Livestock Producer

A Guide to Energy Savings for the Vegetable Producer

A Guide to Energy Savings for the Field Crop Producer

A Guide to Energy for the Orchard Grower

Excellent, basic information on energy conservation for the agricultural community.

American Gas Association

1515 Wilson Boulevard
Arlington, Virginia 22209

AGA Teaching Aids About Gas - information concerning gas technology.

American Petroleum Institute

2101 L. Street N.W.
Washington, D.C. 20037

Facts About Oil - an overview of oil and natural gas.

American Nuclear Society

244 East Ogden Avenue
Hinsdale, Illinois 60521

Q & A: Nuclear Power and the Environment - questions and answers concerning nuclear power.

Channing L. Bete Company, Inc.

Greenfield, Massachusetts 03101

Electric Safety

How to Conserve Energy at Home

Electric Power

Conservation

Coal Gasification

Dump to Dump: Solid Waste Management

Heating Your Home

The ABC's of Oil

Off Shore Energy

Low cost pamphlets for general use.

Bethlehem Steel Corporation

Bethlehem, Pennsylvania 18016

The Story of Coal - background reading book on coal.

Edison Electric Institute

90 Park Avenue
New York, New York 10016

Coal: Answers to Your Questions - an overview of coal's propects for the future.

Electric Power Research Institute

P.O. Box 10412
3412 Hillview Avenue
Palo Alto, California 94303

EPRI Journal: Solar Technology Today (1978) - an up-to-date report on current solar research.

Energy Research Group, Inc.

400-1 Totten Pond Road
Waltham, Massachusetts 02154

New Energy Sources: Dreams & Promises - a realistic appraisal of future alternative energy sources.

Exxon, USA

P.O. Box 2180
Houston, Texas 77001

Mickey Mouse & Goofy Explore Energy Conservation - an excellent resource for intermediate grades.

General Electric

Nuclear Energy Divisions
San Jose, California

Nuclear Power Quick Reference - an excellent reference not only for nuclear but all other energy sources.

McDonald's Corporation

Director-Corporate Responsibility
One McDonald Plaza
Oak Brook, Illinois 60521

Ecology and Energy Action Pack - a booklet of useful activities for intermediate grades.

National Solar Heating and Cooling Information Center

P.O. Box 1607
Rockville, Maryland 20850

Solar Energy and Your Home - useful facts about solar energy.

Politics Today

812 Presidio Avenue
Santa Barbara, California 93101

Skeptic Magazine - a magazine with both sides of the nuclear issue.

Reddy Communications, Inc.

Greenwich, Connecticut 06830

America's Energy - one of the finest documents concerning national energy use and prospects ever written.

In your own school district consult the Library Journal for additional information. The January 1977, 1978 & 1979 issues were devoted to energy. Those issues also contain an Energy Source Directory.

Publisher: R.R. Bowker Company
1180 Avenue of the Americas
New York, New York 10036